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NAVAL POSTGRADUATE SCHOOL

Monterey, California



THESIS

**AN OPERATIONAL INTRANET FOR FIGHTER
COMPOSITE SQUADRON THIRTEEN (VFC-13)**

by

Paul G. Matheson

March 1999

Thesis Advisor:
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**AN OPERATIONAL INTRANET FOR FIGHTER
COMPOSITE SQUADRON THIRTEEN (VFC-13)**

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Lieutenant Commander, United States Navy
B.S., Ohio State University, 1984

Submitted in partial fulfillment of the
requirements for the degree of

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ABSTRACT

This thesis describes the complete development process of an operational Intranet for Fighter Composite Squadron Thirteen (VFC-13), the Naval Reserve's West Coast Adversary Squadron based at Naval Air Station (NAS) Fallon, NV.

The two major elements of research involved designing a simple Web site for the customer and developing a method of fully utilizing GroupWare capabilities to develop a system that would improve information access and dissemination, enhance communication, improve group collaboration, and enhance productivity.

A description of the underlying local area network architecture that supported the Intranet is documented, as it provides the framework for hosting the Intranet. In addition, a description of Web site software development and GroupWare functionality is provided.

This thesis describes the prototype development process that was utilized for the Intranet from the early stages of determining basic requirements through the completion of the final product. Through close communications with the customer during the prototyping process, the finished product was completed which satisfied the customer's requirements.

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I. INTRODUCTION

There is nothing permanent except change. –Heraclitus (540-475 B.C.)

(Peter, 1977)

I first learned of Intranet technology being used in a Naval Aviation squadron when I read the Spring 98 issue of the Naval Helicopter Association magazine *Rotor Review*. In that issue was an article entitled "Scorpions in the 21st Century" by then LT Joe Dundas, USN. A similar article was also posted in *CHIPS* magazine. The HSL-49 Intranet was designed by two members of that H-60 helicopter squadron, LCDR Dundas and AWC Flake. On 16OCT98, I visited HSL-49 stationed at NAS North Island, San Diego, CA, and was given a brief by LCDR Dundas and AWC Flake on the Intranet they had developed at HSL-49. LCDR Dundas, an NPS graduate, had a vision of a "Digitized Squadron" and has made a concentrated effort to share the Intranet technology that HSL-49 has implemented to the fleet. The HSL-49 Intranet utilizes Novell NetWare, early versions of Microsoft software and other various vendor software applications due to CPU limitations of some of the networked computers. Although they have implemented a functional Intranet, unfortunately there was no documentation on its design, implementation or maintenance. In addition, the system was not based on the current IT-21 prescribed Microsoft Windows NT 4.0 and Office 97 suite of software. However, the HSL-49 Intranet was a superb example of how to tap into the potential of Intranet technology, specifically in the context of a Naval Aviation squadron. Therefore, the challenge had been set as to figure out how to articulate Intranet design, development and maintenance for a typical Naval Aviation squadron.

A. PURPOSE

The primary purpose of this thesis was to develop an operational Intranet for the thesis sponsor, Fighter Composite Squadron THIRTEEN (VFC-13), the Naval Reserve's West Coast Adversary Squadron based at Naval Air Station (NAS) Fallon, NV. The objectives were to examine the sponsors business practices and organization to determine basic requirements, develop a prototype design, and then implement an operational system. The two major elements of research involved designing the customer a Web site

and developing a method of fully utilizing the capabilities of the GroupWare to develop a system that would improve information access and dissemination, enhance communication, improve group collaboration, and enhance productivity. The software tools chosen to develop the Web site were selected because of their ease of use and creation, while providing a low cost solution to meeting the goals set out in the basic requirements. The GroupWare utilized was the standard for the base, but has similar features to many other vendor GroupWare products.

The secondary purpose was to document the design, implementation and maintenance processes so that a typical Naval Aviation squadron could utilize the information as a guide in their own Intranet programs. As the military works towards incorporating distributed computing to fulfill the vision of the Navy Worldwide Intranet (NWI), there will be growing pains as members adjust to the change from their current work habits and systems. This transformation may cause confusion as units delve in new directions to find technological solutions to their basic requirements. With a myriad of publications on LAN development, software solutions and Intranet development, one can easily become lost in the sea of information when searching for solutions. The information provided in this thesis supplements what has already been written in the numerous referenced publications and presents a case study of a successful implementation of Intranet technology.

B. ASSUMPTIONS

The research was based on a few assumptions concerning computer hardware, software, and the personnel charged with their care in a typical Naval Aviation squadron.

The first assumption was that Naval Aviation squadrons had local area networks (LAN) or were in the process of developing or planning their own LAN. Although the customer had acquired computers with the latest CPU's at the time, it was assumed that most squadrons still had some vintage (e.g. Intel X386) computers in their inventories.

The second assumption was that squadron LAN's would be run on a Microsoft Windows NT platform in compliance with IT-21 initiatives. Although the customer had the latest version of NT Server and all clients had NT workstation, it was assumed that many squadrons were still utilizing Windows95 on the client side.

The last assumption was that the LAN's were designed, implemented and maintained by members within the squadron. It was further assumed that not all network

administrators were proficient at the monumental task of managing the network. Although the customer had a few members with adequate computer experience and some that had attended a short course in Windows NT, it was assumed that most squadrons are inadequately manned and trained to properly run a LAN.

It was through these assumptions that measures were taken to ensure that the design, implementation and maintenance procedures were written in such a manner as to be understood by a typical squadron network administrator.

C. RESEARCH QUESTIONS

The following research questions establish a framework for this thesis.

1. What were the different types of software required to develop, host and maintain an Intranet and how did they inter-operate with each other?
2. Given that Fighter Composite Squadron THIRTEEN (VFC-13) used Microsoft Office97 products, how could those software programs be utilized to post information onto the Intranet Web?
3. How could the Intranet be designed to best utilize the functions of the GroupWare software?
4. What reports, instructions and other information that was currently published in paper format could be published on the Intranet to improve information dissemination throughout the squadron?
5. How were forms created to enable information input to databases or posted on the Intranet Web site?
6. What were the top priorities for incorporation into the Intranet given the timeframe of the project?
7. How could remote users be provided connectivity to the Intranet Web site and GroupWare accounts?
8. What are the security issues surrounding the Intranet Web site, GroupWare and Internet access?
9. How could the Intranet Web site be designed to keep it simple and easily maintained?
10. What information and documentation would be necessary to allow the squadron to maintain the Intranet once the project had been completed?

11. What information would need to be documented to allow other squadrons to design, implement and maintain a similar Intranet?

D. THESIS OUTLINE

This section contains a brief summary of the thesis chapters.

1. Chapter I. Introduction

This chapter describes the purpose of the thesis, a few basic assumptions, provides a list of research questions and a thesis outline.

2. Chapter II. Customer

This chapter briefly describes VFC-13 squadron history, their mission, and the organizational structure.

3. Chapter III. Local Area Network

This chapter briefly describes Local Area Network (LAN) concepts and terminology as well as the customer's LAN architecture.

4. Chapter IV. Intranet

This chapter describes Intranet concepts and terminology that sets the scope for the customer's Intranet design.

5. Chapter V. Prototype Model

This chapter describes rapid prototyping development process methodology and provides the rationale for its incorporation in this project.

6. Chapter VI. Identification of Basic Requirements

This chapter provides the results of the basic requirements analysis for determining the structure and content of the Intranet.

7. Chapter VII. Prototype Development

This chapter describes the initial and iterative designs of the Intranet. It also includes a description of the final operational product delivered to the customer.

8. Chapter VIII. Conclusions and Recommendations

This chapter provides a conclusion to the merits of the designed and installed Intranet. Also included in this chapter are recommendations to the customer for continued growth of the Intranet. In the last part of the chapter are some recommendations for the DOD in general.

E. EXPECTED BENEFITS OF THESIS

The expected benefits of this thesis were intended to be twofold. First, that the customer's Intranet composed of the operational Web site and GroupWare would be fully utilized by squadron members, even those members who were more comfortable with the traditional paperwork means of accomplishing business. The Intranet was designed to be simple to assist the customer in publishing and sharing information on a private Web site. Another benefit of this simple design was that it would enable the squadron Webmaster to easily maintain the Web site long after it had been initially implemented. The procedures outlined in this thesis concerning GroupWare functionality were also kept simple so members would actually use the proposed system.

The second intended benefit of this research project was to provide documentation on basic Intranet design, implementation and maintenance so that other Naval Aviation squadrons would have an initial resource for this type of information. Although most squadrons have varying network architectures, their basic requirements and formal organizations are generally the same. Therefore, the information contained in this thesis will be pertinent, but the means of practical implementation may vary accordingly.

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II. CUSTOMER

A. INTRODUCTION

The idea of developing an Intranet originated through a conversation with the Information System Security Manager Officer at VFC-13 on 06OCT98. The command immediately welcomed the idea of Intranet development and agreed to sponsor my efforts. The purpose of including this chapter is to provide a basic description of the various billets and responsibilities within a naval aviation squadron for the viewer who may not be familiar with squadron composition. Every billet in the squadron has not been identified here. From this description, one can better understand where the basic requirements for the Intranet were derived.

B. HISTORY

The "Fighting Saints" of VFC-13 trace their origins back to 1946, when VF-753 was commissioned flying F6F-5 "Hellcats." Today's squadron was formed on Sept. 1, 1973, at NAS New Orleans during the reorganization of the U.S. Naval Reserve.

Initially, the squadron operated the Chance Vought F-8H "Crusader" with a complement of 17 officers and 127 enlisted men, former members of VSF-76 and VSF-86. In April 1974, the "Saints" made the transition to the single-seat A-4L "Skyhawk."

As the demand for West Coast adversary services and other fleet support missions increased, the squadron was permanently transferred to NAS Miramar, in February 1976.

In 1988, the squadron moved to the F-4F "Super Fox." October 1993 marked the end of an era when VFC-13 made the transition to the single-seat, two engine F/A-18 "Hornet." This change further enhanced the squadron's ability to perform its adversary mission by providing an even more capable and realistic threat aircraft. In April 1996, the command relocated to NAS Fallon and made the transition to the F-5E/F Tiger II, supported by McDonnell Douglas contract maintenance. (Fallon)

C. MISSION

The "Fighting Saints" provide a formidable dissimilar adversary threat. In recognition of that primary mission assignment, VC-13 was proudly redesignated as

Fighter Squadron Composite Thirteen (VFC-13) April 22, 1988. VFC-13 provides quality adversary training for regular Navy fleet and replacement squadrons and air wings, reserve fighter and attack squadrons, USAF and USMC units, and Canadian forces. The Fighting Saints have received two consecutive CNO Safety Awards, the Golden Wrench Maintenance Award and a Battle "E" award through the years. (Fallon)

D. SQUADRON ORGANIZATIONAL STRUCTURE

1. Overview

The squadron structure can basically be described in four parts: Executive Office, Departments, Command Organizations and Collateral Duties. The Executive Office was made up of the Commanding Officer, Executive Officer, Officer-in-Charge and Command Senior Chief. There were five departments: Operations, Maintenance, Administration, Safety and Training. There were also multiple Command Organizations and Collateral Duties. The squadron was similar in makeup to many naval aviation squadrons with two exceptions. First, because of Boeing contractor maintenance, the Maintenance Department had a very small Navy component that was atypical to squadron manning. Second, due to the Reserve component, there were differences in the Executive Office component and other areas. These differences are pointed out briefly. For the most part however, the billets and associated responsibilities of the customer were standard to other Naval Aviation squadrons. All information in this chapter was obtained from the Squadron Organizational Manual (SORM).

E. EXECUTIVE OFFICE

1. Commanding Officer

The Commanding Officer (CO) devotes his time to matters concerning command policy, morale and personal liaison with other commands. The Commanding Officer has absolute responsibility for the safety, well-being and efficiency of his command. The detailed duties and responsibilities of the Commanding Officer are established by U.S. Navy Regulations, general orders, customs and traditions. The authority of the Commanding Officer is commensurate with his responsibilities and subject to the

limitations prescribed by law and U.S. Navy Regulations. For operational and administrative control, the Commanding Officer reports to COMCVWR-20. (SORM)

2. Executive Officer

The Executive Officer (XO) is be responsible for decisions, recommendations and actions in connection with the details incident to carrying out the functions of command. The Executive Officer functions as a direct representative of the Commanding Officer in carrying out the mission of the command. The XO is specifically charged with matters pertaining to the morale, discipline, training, welfare, work, exercise, safety, rights and privileges of individuals within the command, i.e., the internal administration of VFC-13.

3. Officer-in-Charge

The RESFORON Officer-In-Charge (OIC) billet is unique to the Naval Reserve. The OIC is normally the senior TAR Officer in the squadron. However, the billet is not filled when either the Commanding Officer or Executive Officer is a TAR, or when the command is mobilized. In addition to his squadron-related duties, he is assigned in an Additional Duty (ADDU) status to COMCVWR-20. In the absence of the Commanding or Executive Officer, he performs all command-related duties as assigned.

4. Command Senior Chief

The Command Senior Chief is the senior enlisted advisor to the Commanding Officer on the formulation and implementation of policies pertinent to morale, welfare, job satisfaction, discipline, utilization and training of all enlisted personnel. Additionally, he implements leadership training for senior enlisted personnel. He acts as assistant to the Executive Officer in all matters relating to enlisted military duties, discipline, appearance and conduct.

F. DEPARTMENTS

1. Overview

The Department Heads oversee the work of their departments and are responsible for the proper indoctrination and training of personnel assigned to their departments.

Because of the uniqueness of a RESFORON and the integration of Selected Reserves (SELRES) and active duty/full time support (FTS) personnel (TAR/USN), VFC-13 billet structure is designed to place both SELRES and TAR officers in positions of responsibility that will adequately prepare them and allow them to be competitive for applicable Department Head, Officer in Charge and Commanding Officer assignments. VFC-13 Department Head billets will be manned by a SELRES/FTS team who share equal responsibility for the performance of their department. The Senior member of each team has the final authority to resolve differences of opinion within their department. The success of each department will depend, in large part, on the ability and willingness of both department head team members to work in a cooperative manner for the good of the command. Both SELRES and FTS department heads are credited with department head positions on their respective fitness reports (FITREPs). The specific duties for squadron department heads are listed under the respective department chapters.

2. Operations Department

a. Operations Department Heads

The SELRES and FTS Operations Department Heads function as a leadership team with equal responsibility for the execution of all duties assigned to the Operations Department. Responsible to plan and supervise the operation of squadron aircraft and ensure that flight crews are properly instructed and knowledgeable in flight tactics and doctrine, safe operation of aircraft and current operating procedures.

b. The Schedules Officer

The Schedules Officer is responsible for the promulgation and coordination of squadron aircrew flight and ground training schedules. He ensures that the daily Squadron Flight Schedule is prepared and distributed. He prepares and maintains the syllabus progress status board.

c. Detachment Coordinator

The Detachment Coordinator is responsible for assisting the Operations Officer in the overall planning, execution and post-detachment requirements associated

with scheduled squadron detachments. He assists in the coordination with other departments for pre-detachment planning requirements. He coordinates with the Operations Officer concerning aircrew assignments, transit requirements, type orders, etc.

d. SFARP Officer

The SFARP Officer is responsible for implementation, standardization and training for the SFARP program. He communicates with VF/VFA squadron operations departments to schedule SFARP operations. He coordinates and schedules all range requirements.

e. SFARP Subject Matter Experts (SME)

The SFARP SME's are responsible for developing and giving lectures on their assigned area of expertise as required. They are required to prepare and maintain up-to-date lectures on assigned area of expertise. They give lectures to incoming SFARP squadrons in accordance with the schedule published by the SFARP Officer and provide in-house training as tasked by the Training Officer.

f. Airwing Training Officer

The Airwing Training Officer is responsible for implementation of the squadron airwing training program. He maintains liaison with Naval Strike Air Warfare Center (NSAWC) for current Airwing tactics, employment, tasking and administrative planning. He assists the Ground Training Officer with the fighter tactics training program. He develops and implements a Range Training Officer (RTO) training program and monitor squadron RTO's for standardization and accuracy.

g. FRS Officer

The FRS Officer is responsible for the squadron FRS training program. He maintains liaison with FRS squadrons for scheduling FRS operations and current training program requirements. He ensures the execution of the current FRS programs are standardized throughout the squadron.

h. Electronic Warfare (EW) Training Officer

The Electronic Warfare (EW) Training Officer maintains the electronic warfare training and qualification program to be included in the ground training program. He develops and implements an EW training program to be included in the squadron ground training program. He maintains liaison with Naval Strike Air Warfare Center (NSAWC) for current fighter EW training.

i. Det OIC

The Det OIC is responsible for the planning, execution and post-detachment requirements associated with scheduled squadron detachments. He coordinates with Maintenance and Administrative Departments for pre-detachment planning requirements. This includes, but is not limited to berthing, messing and rental vehicles. He coordinate with the Operations Officer concerning aircrew assignments, transit requirements, type orders, etc.

j. ISSM officer

The squadron's Information System Security Manager ISSM officer is responsible for ensuring adequate security of ADP systems. The security program includes software and hardware security features as well as administrative, physical and personnel security controls for providing an adequate degree of security of ADP systems. He develops and maintains the command's ISSM Security Program to support accreditation responsibilities and requirements. The program should include: conduct of risk assessment, security test and evaluations and contingency planning.

k. NWP Custodian

The NWP Custodian is responsible to the Operations Officer for maintaining the current allowance of publications. He will exercise control over the receipt, correction, stowage, security, accounting, distribution and authorized destruction of all publications. He ensures the authorized publication allowance is available for issue.

1. Intelligence Officer

The Intelligence Officer is responsible for the dissemination of current intelligence information to squadron aircrew.

3. Maintenance Department

a. Maintenance Officer (MO)/Aircraft Maint Officer (AMO) /Contracting Officer Representative (COR)

The MO functions as the head of the Maintenance Department and is responsible for all duties assigned to that department. The MO will normally function as the COR and provide on-site contract administration for specifically delegated functions set forth in the contracting officer's appointing letter. She is familiar with training and qualification requirements. She administers the operation of the Maintenance Department under the direction of the Commanding Officer and in accordance with appropriate directives.

4. Administration Department

a. SELRES/FTS Administrative Department Heads

The SELRES/FTS Administrative Department Heads functions as a leadership team with equal responsibility for the execution of all duties assigned the Administrative Department. He processes incoming and outgoing official correspondence in accordance with the standard procedures and ensures that such correspondence is properly accounted for and expeditiously routed.

b. Mobilization/Readiness Officer

The Mobilization/Readiness Officer is responsible for achieving and sustaining a level of personnel and equipment readiness which will ensure availability of VFC-13 for immediate employment in the event of recall by higher authority. He maintains administrative readiness to expeditiously mobilize assigned Selected Reserve personnel in the event of mobilization.

c. RSTARS Officer

The RSTARS Officer is responsible for the management and implementation of RSTARS procedures for all the Selected Reserves. He reviews and audits drill folders, drill musters and drill cards for all Selected Reserves (SELRES). He ensures all muster sheets for drill weekends are accurately documented and that all SELRES are accounted. He ensures documentation for Rescheduled and Equivalent Training drills is complete, accurate and in keeping with command policy. He reviews the verified pay listings, ensuring all discrepancies have been noted and have been expeditiously processed.

d. Personnel Officer

The Personnel Officer assists the Administrative Department Heads in the discharge of assigned duties. In addition, he serves as the Communications Officer when no other individual is assigned the duty. He performs the duties of the Administrative Department Division Officer. He is responsible for the review and updating of all squadron instructions and directives. He coordinates the Squadron TEMADD program.

e. Legal Officer

The Legal Officer is responsible for advising and assisting the Commanding Officer and Executive Officer in all legal matters. He is responsible for the proper administration of the Uniform Code of Military Justice within the squadron and he assists squadron personnel in all matters requiring legal advice. The Legal Officer coordinates the preparation of legal administrative work through the Administrative Office.

f. Public Affairs Officer

The Public Affairs Officer is responsible for facilitation and enhancement of communications between the Commanding Officer and the officers and men and women of the command, the command and other segments of the internal public, and the command and the external public. He generates publicity for the command and its personnel through active liaison with local news media and the Fleet Hometown News Center.

g. Communications Officer

The Communications Officer is responsible for the squadrons overall communications program including communications security. He supervises the operation of the command's communications in accordance with squadron directives and directives from higher authority. He supplies assistance to drafters of messages within the command regarding message preparation and provides command training of naval message procedures.

h. Awards Officer

The Awards Officer is responsible for assisting the Commanding Officer in evaluating recommendations for awards to personnel in the command and to ensure compliance with all directives of higher authority. He inquires into and analyzes all command recommendations for formal or informal awards requiring review.

i. Security Manager

The Security Manager is responsible to the Commanding Officer regarding security of classified information. The Security Manager is responsible for coordinating all aspects of the Information Security Program to ensure proper classification management, personnel security, information systems security, and physical measures for protecting classified material and security education and training.

j. Physical Security Officer

The Physical Security Officer is responsible for the security of assigned spaces and aircraft. He determines the adequacy of the physical security of squadron spaces and aircraft and identifies those areas which require improvement.

k. First Lieutenant Officer

The First Lieutenant Officer is responsible for the maintenance, security and cleanliness of all squadron spaces and for vehicles assigned to the First Lieutenant and the squadron.

1. TQL Coordinator

The TQL Coordinator is responsible in formulating a quality-focused strategic improvement plan and coordinating the resources necessary to deploy and implement the plan in the squadron. He advises, consults, and assists the Commanding Officer and the Educational Services Officer in planning for and improving performance in the organization. He monitors progress on strategic improvement initiatives and supporting activities, such as training and organizational assessments.

5. Training Department

a. SELRES and FTS Training Department Heads

The SELRES and FTS Training Department Heads function as a leadership team and are equally responsible for all duties assigned to that department. Final decision making authority will rest with the more senior member of the Department Head team. He plans and supervises the formulation and administration of the tactical, pilot, and ground training programs internal to the command. He maintains liaison with the Operations Department in coordinating appropriate training for all aircrew in conjunction with squadron deployment and support activities. He supervises the planning and execution of Regular Drill Period (RDP) training.

b. Standardization Officer

The Standardization Officer is responsible for the standardization of all squadron adversary training programs, fleet and FRS support programs, and the enforcement of all squadron directives which pertain to the aforementioned items. He is also responsible for implementation, standardization and instructor training of the squadron's Adversary Tactics training program. He acts as Chairman for Standardization Board (Stan Board) and monitors the implementation of the Instructor-Under-Training (IUT) syllabus.

c. Pilot Training Officer

The Pilot Training Officer functions as an advisor to the Training Department Head in the formulation and administration of the pilot training program. He

prepares an annual Adversary Pilot training program to be implemented on a monthly basis.

d. IUT Officer

The IUT Officer, in conjunction with the Training Department, is responsible for the Instructor Under Training Syllabus. He provides input to the Training Department for the following training programs: Pilot FAM/TAC, RIO FAM/TAC, Functional Check Flight, and Range Training Officer.

e. Ground Training Officer

The Ground Training Officer functions as an advisor to the Training Department Head in the formulation and administration of the ground training program. He establishes an annual ground training syllabus to be implemented on a monthly basis.

6. Safety Department

a. Safety Department Head

The Safety Department Head serves as the head of his department and be the principle advisor to the Commanding Officer in all matters concerning safety. He is responsible for the implementation, promotion and maintenance of the squadron safety program to ensure the maximum degree of operational training readiness. He promotes the squadron safety program in cooperation with other Department Heads. He maintains pertinent safety literature for ready reference.

b. Aviation Safety Officer (ASO)

The ASO functions as the advisor on aviation safety to the Commanding Officer via the Safety Officer. The ASO shall be a graduate of the ASO Course, Naval PostGraduate School, Monterey, CA. He advises and assists the Commanding Officer and Safety Department Head in management of the squadron's aviation safety program.

c. Ground Safety Officer

The squadron Ground Safety Officer is responsible for implementing those aspects of the squadron safety program dealing with ground/maintenance safety. He is supervises the squadron hearing and sight conservation programs, squadron industrial and motor vehicle safety programs, and investigates all non-aviation squadron mishaps and makes reports as required by higher authority. He ensures the NAVOSH program is maintained in accordance with all applicable instructions.

d. F-5 Model Manager

The F-5 model manager is responsible for the overall upkeep and maintenance of the F-5 NATOPS Program for the NAVY and Marine Corps. He performs annual F-5 NATOPS Unit Evaluations on all Navy and Marine Corps F-5 Squadrons. He trains, evaluates and designates F-5 NATOPS instructors and evaluations.

e. NATOPS Officer

The NATOPS Officer is responsible for the implementation of the Naval Air Training and Operating Procedures Standardization (NATOPS) Program. He reviews all squadron standard operating procedures to ensure compliance with NATOPS and oversees the NATOPS examination program.

f. Aircrew Coordination Training Officer

The Aircrew Coordination Training Officer is responsible for implementation and standardization of the aircrew coordination training program. He develops and implements an aircrew coordination training program and a squadron tac-admin standard operating procedures (SOP) guide.

g. Survival Officer

The Survival Officer is responsible for the survival training of squadron aircrews. He ensures a well-rounded, continuing survival training program for all hands.

***h. Navigation Publications NAVPUBS/Instrument Ground School
(IGS) Officer.***

The Navigation Officer is responsible for the training of pilots in aerial navigation and for maintaining the navigation library. He ensures that all hot areas are posted and up-to-date in briefing areas and maintains an adequate stock of navigational charts and publications.

G. COMMAND ORGANIZATIONS

1. Senior Watch Officer (SWO)

The SWO, under the direction of the XO, is responsible for all matters pertaining to Watchstanding within the squadron. The SWO indoctrinates and assigns qualified officers and chief petty officers as Squadron Duty Officer (SDO) and senior first class petty officers as Assistant Squadron Duty Officer (ASDO).

2. Command Managed Equal Opportunity Officer (CMEO)

The CMEO is responsible for establishing, implementing and monitoring a Command Managed Equal Opportunity Program. Identify EO/sexual harassment problems/concerns and recommend solutions to the Commanding Officer. Monitor the Command Training Team. Ensure prospective members are formally trained in conducting NR&R workshops.

3. The Officer Mess Treasurer

The Officer Mess Treasurer is responsible for all financial matters of the Officer's Mess.

4. Command Career Counselor

The Command Career Counselor is responsible for implementing and effecting the Command Retention Program to retain quality first term, second term and career personnel through Career Information Program Management (CIPM). The Command

Career Counselor is also responsible for the professional development of the enlisted personnel and the Sponsor Program for newly assigned personnel.

5. PRT Coordinator

The PRT Coordinator is responsible for the implementation of an effective squadron physical fitness program and for providing an effective weight control program for the benefit of the health, safety and well-being of squadron personnel.

6. Morale, Welfare and Recreation Officer

The Morale, Welfare and Recreation Officer is charged with responsibility for the management of the welfare and recreation activities.

7. Drug/Alcohol Program Advisor (DAPA)

The DAPA assists the Commanding Officer in administering and coordinating Navy policies and procedures concerning drug and alcohol education. He ensures familiarization and compliance with all instructions and notices from higher authority concerning the administration and operation of various drug and alcohol abuse/education programs within the squadron.

8. Urinalysis Program Coordinator (UPC)

The Urinalysis Program Coordinator (UPC) is the overall manager of the command's Urinalysis Testing Program.

9. Ombudsman

The Ombudsman is the link between the Command and families of assigned squadron members providing them information and assistance on established Navy programs. She keeps the CO informed about the command families.

10. Command Financial Specialist

The Command Financial Specialist is responsible for providing financial planning to all personnel within VFC-13. He counsels, advises and provides financial planning based on an individual's paygrade and outgoing expenditures.

11. Sexual Harassment Prevention Coordinator

The Sexual Harassment Prevention Coordinator is responsible for advising the Commanding Officer on all issues concerning Sexual Harassment.

H. COLLATERAL DUTIES

1. Educational Services Officer

The Educational Services Officer is responsible for the administration of the squadron's education advancement program. He monitors enlisted and officer participation in civilian educational matters, including screening tuition assistance applications and provides proctors for advancement examinations.

2. FOD Prevention Officer

The FOD Prevention Officer is responsible for providing a continuously effective FOD prevention program to help ensure the health and safety of all squadron personnel and reduce material damage costs.

3. Hearing Conservation Petty Officer (HCPO)

The HCPO is responsible for ensuring personnel in VFC-13 incur no loss of hearing ability resulting from exposure to injurious sound levels. The Squadron Safety Petty Officer is designated as the Hearing Conservation Petty Officer. He maintains liaison with the industrial hygienist for noise surveys and technical assistance.

4. Military Cash Awards Program Administrator (MILCAP)

The Military Cash Awards Program Administrator (MILCAP) is responsible for the implementation of the squadron's MILCAP Program.

5. PSD Liaison

The PSD Liaison is responsible for the orderly flow of services that are required between the squadron and the local PSD. The PSD Liaison will normally be assigned to the Administrative Chief Petty Officer. He maintains liaison with PSD concerning all

transactions between the command and PSD, i.e. service record entries, leave, pay, evaluations, travel claims, etc.

6. Voting Assistance Officer

The Voting Assistance Officer is responsible for ensuring pertinent information on Federal and Local elections is made available to members of the command so that they are able to exercise their constitutional right to vote. He ensures sufficient absentee voter registration forms and Federal Voting Assistance Program Guides are available.

III. LOCAL AREA NETWORKS

A. INTRODUCTION

The Information System Security Manager Officer (ISSM) at VFC-13 organized the procurement of computer hardware and software in early 1998 for the purpose of deploying a Local Area Network (LAN). Prior to the procurement of the hardware and software, a survey of existing conditions and a network requirements analysis was conducted by the customer. The results of the requirements analysis can be found in Appendix A - Abbreviated Systems Decision Paper (ASDP). The ASDP is an excellent resource to view hardware and software products with associated prices at the time. All requirements were addressed in concert with IT-21 initiatives. In October 1998, the squadron received a majority of the requested items from Gateway. The data link technology and physical plant were chosen, implemented, and maintained by the NAS Fallon Automated Information Systems (AIS) office.

During my second visit to VFC-13 in DEC98, I assisted in configuring the LAN's hardware and software. Together I worked with LT "Benny" Suggs and IS1 Priesach both recent attendees of the Navy's one week Microsoft Windows NT 4.0 course, as well as Leonard Milbauer, a NAS Fallon AIS employee, in deployment of an operational LAN.

The idea of having an Intranet hosted on the LAN was not a consideration at the time of initial hardware and software procurement. The Intranet concept was posed later through a conversation with the then VFC-13 ISSM Officer.

B. CUSTOMERS LAN ARCHITECTURE

1. Overview

This chapter provides some basic concepts regarding Local Area Networks (LAN). It also provides a description of the LAN architecture, hardware, and software employed by the customer at the time of Intranet development. The information provided contains a general overview of LANs such as client server. There are vast resources online and at bookstores in addition to the references found in this thesis to learn more about LAN design.

2. LAN Background

The term Local Area Network (LAN) refers to a relatively high-speed network that serves a single physical location, such as an office suite or a building. Computers on the network, called nodes, are connected to each other with some type of cable. The type of cable that connects the nodes depends on the type of network architecture. [Stern, 1997]

Prior to describing the customer's LAN, the existing networks that were already in place at the time which affected the customer's LAN will be described to give a better understanding of the customer's final network architecture plan. The two networks of interest were the NAS Fallon base LAN and the VFC-13 contract maintenance LAN.

First, NAS Fallon had an existing base LAN established at the time of the customer's LAN development. This base LAN provided email service and Internet access for the entire base. Most of the LAN was run on Novell NetWare with a few exceptions, the customer being one. NetWare is a popular network operating system developed by Novell in the early 1980's. NetWare is a cooperative, multitasking, highly optimized, dedicated-server network operating system that has client support for most major operating systems.

E-mail service was provided through a Novell GroupWise Server. Electronic mail (e-mail) is a type of client/server application that provides a routed, stored-message service between any two user e-mail accounts (Strebe, 1998).

Internet access was attained through an IPX Gateway. Internetwork Packet eXchange (IPX) is the network protocol developed by Novell for its NetWare product. IPX is a routable, connection-oriented protocol similar to IP (Strebe, 1998). A gateway is a computer that serves as a router, a format translator, or a security filter for an entire network (Strebe, 1998). The gateway was connected to a commercial Internet Service Provider (ISP). An ISP is a company that provides dial-up connections to the Internet (Strebe, 1998).

There were no firewalls established on the NAS Fallon LAN at the time of implementing the customer's LAN. A firewall is a security system with specialized software to prevent outsiders from invading a private network (Laudon, 1997).

It was proposed that in the future, the GroupWise Server and IPX Gateway would be replaced by a Microsoft Exchange Server and an IP Gateway. Internet Protocol (IP) is the network layer protocol upon which the Internet is based. IP provides a simple

connectionless packet exchange. (Strebe, 1998). In addition, it was proposed that a firewall would be introduced. The affects of these changes on the customer are addressed in a final chapter.

Second, the squadron had a unique organizational structure in that they had Boeing contract maintenance personnel that maintained the jet aircraft. These contractors resided on the ground floor of the two-story hangar building. At the time of the customer's LAN development, the contractors had two existing LANs located on the ground floor. One LAN was for the Naval Aviation Logistics Computerized Organization Maintenance Information System (NALCOMIS) and one for specific Boeing, Inc. proprietary purposes. The NALCOMIS LAN was primarily utilized for maintenance functions, although these systems (Pentium 133, 16 MB RAM) were configured to allow access to the base LAN features on a limited basis. Additionally, three of these NALCOMIS LAN machines were installed in the upper level spaces of the hangar to allow the Maintenance/Contract Officer, the Maintenance Monitoring Team (MMT) and the Operations Department to tap into NALCOMIS based databases and information. The NALCOMIS system was run on a Novell network with a Unix database. The Boeing, Inc. LAN was a Windows NT / Exchange based system used for communications between the various divisions of the contracting company at NAS Fallon.

The customer's LAN was designed primarily for the Navy members of the squadron who are primarily resident on the on the second floor of the hangar. Based on the aforementioned existing LAN, there was no intention of incorporating the maintenance contractor's LAN into the customer LAN. The original intent of the LAN was to enable file and print sharing amongst the squadron's Navy personnel. A hub was located in an electrical closet on the second floor to connect all the client computers to enable data transfer. Additionally, that hub connected to the ground floor contract maintenance hub to provide connectivity to the NAS Fallon LAN for email and Internet access. The development of the LAN provided the base from which to run the Intranet and is described in the following chapter. An overview of the LAN architecture is described in the next section and is graphically portrayed in Appendix B - Customers LAN Architecture.

3. Network Architecture

a. Data Link Technology

Of all the network architecture data link technologies, Ethernet is the most widely used. Ethernet was the data link technology utilized by the NAS Fallon LAN as well as the customer's. Designed jointly by Xerox, Intel and Digital Equipment in the 1970s and 1980s, Ethernet provides 10Mbps shared bandwidth, and uses a technique called Carrier Sense Multiple Access/Collision Detection (CSMA/CD) to ensure accurate data transmissions. (Stern, 1997) Carrier Sense Multiple Access with Collision Detection or CSMA/CD is control access method through which several nodes can transmit over one cable (multiple access) although not simultaneously. Any device that wishes to send data firstly has to check that no one else is currently using the LAN. It listens for (i.e. Senses) any signals on the LAN, known as a "carrier". If no carrier signal exists, it means no one else is using the LAN. The device can now transmit it's data, but while doing so checks the signal to make sure it has not collided with data from other devices further down the LAN. If no collision occurs it assumes the data has been sent successfully. If a collision does occur it knows two things. The data has been lost and must be resent, and someone else is trying to use the LAN. Thus it waits for a short time, measured in millionths of seconds, in the hope that the other party will finish its transmission, and then resends the data. This CSMA/CD process is repeated until the data is successfully sent. (Data, 1999)

b. Physical Plant

There are two considerations in planning a physical plant, type of cabling and topology.

(1) Type of Cabling. Cabling connects computers to a hub and to outside connections. All modern networks operate over one of two types of cable, Category 5 unshielded twisted pair (UTP) or optical fiber. Category 5 unshielded twisted pair (UTP), or CAT5 UTP, has the highest level of data transfer rate amongst UTP wire. CAT5 UTP consists of 4 pairs of twisted copper wire. It is rated up to 100Mbps known as 100baseT (Fast Ethernet), but can also transfer data at a rate of 10 Mbps or 10baseT. There is a distance limitations of UTP wiring which restricts its use to connecting client

computers to a hub in a relatively small area (within 100 meters of a wiring closet). (Strebe, 1998) Since none of the cable lengths in the customers hangar exceeded CAT5 limitations and because it was less expensive and easier to install than optical fiber, the NAS Fallon ADP office chose to install CAT5 for the customer's LAN.

(2) Topology. Topology describes the physical layout of a network-cabling scheme. The topology for an Ethernet network varies depending on the type of cabling implemented. 10/100BaseT topology will be addressed here. 10/100BaseT uses a star topology. In a star topology, each node is connected directly to a single point, or hub, which prevents the network from going down if a workstation is disconnected. [Strebe, 1998]

c. Hardware

The following hardware items, hubs, patch panels, jack boxes, RJ-45 connectors, and Network Interface Cards (NIC's), are briefly described to round out the description of the LAN. The NAS Fallon AIS Office funded and installed the mount rack, hub, patch panels, cable with RJ-45 connectors and jack mount boxes. The NIC's came with each computer.

(1) Hubs. Twisted pair Ethernet networks arrange the network cable so that they all run from the networked computers to a central point. A hub connects the cables at the central point. Some hubs, like the one used by the customer (Centre COM 3024TR, 10BASET Network Ports, 24-port hub), merely rebroadcast a signal received on any one cable over all the other cables. The hub is typically mounted on a rack in an electrical closet. There are other more sophisticated hubs, called switching hubs, which can determine the destination of a packet and only retransmit the signal on the corresponding cable. (Strebe, 1998)

(2) Patch panels. A patch panel is a device used to connect cables from client computers to the hub more efficiently. The NAS Fallon AIS office installed 3 24-port, Panduit Data-Patch Cat5 patch panels for the customer.

(3) Dual jack surface mount boxes. Cable is run from each room in a building to a central location where the hub is housed. When the cable ends in a room, it is set in a jack mount box, similar to a phone wall outlet. A sufficient number of dual jack surface mount boxes were installed in each room of the squadron to enable each of the computers to connect to the LAN.

(4) R-J45 connectors. A RJ-45 connector is similar to a phone jack. It connects the cable to the computer through the NIC and to the wall outlet through the jack mount box.

(5) Network Interface Cards (NIC). The network interface card (NIC) connects the computer to the cable and translates the data from the computer into a form that can be transmitted over the cable medium.

4. Client-Server Computing

a. Overview

Client-Server computing is the division of an application into two parts, with one part running on the server and the other running on a PC or workstation. It can be described as an architecture for LAN applications program. The rationale behind client/server computing is to exploit the local, desk top processing power leaving the server to govern the centrally held information. This should not be confused with PCs holding their own files on a LAN, as here the client or PC is carrying out its own application tasks. Nevertheless such systems are helping the market move in the direction of true client/server computing, the advantages of which include less network traffic and more flexibility. [Data, 1999]

b. Protocols and terminology

(1) Protocols. In order for two computers to communicate over the network, they must assign the same meaning to the same sequence of signals. When one computer sends information, the other must be prepared to receive it. Protocols define the meanings assigned to signals, which data is sent and in what order, and how the computers negotiate the sending and the receiving of data. For example, just as Morse code assigns letters of the alphabet to sequences of long and short signals, Ethernet (a protocol used by network adapters over network cable) assigns numerical values to sequences of electrical pulses. Also, just as the letters in Morse code must combine to form understandable words, the numbers transmitted over Ethernet must combine to form valid Ethernet packets. (Strebe, 1998)

(2) TCP/IP. Transmission Control Protocol/Internet Protocol (TCP/IP) is a suite of network protocols upon which the global Internet is based. TCP/IP

is a general term that can refer either to the TCP and IP protocols used together or to the complete set of Internet protocols. TCP/IP is the default protocol for Windows NT. (Strebe, 1998)

(3) NETBUI. NetBEUI stands for NetBIOS Extended UserInterface (and NetBIOS stands for Network Basic Input Output System). NetBEUI implements the NetBIOS frame (NBF) transport protocol, which IBM developed in the mid-1980's to support LAN workgroups under OS/2 and LAN Manager. NetBEUI cannot be routed between networks, so it is constrained to small LANs consisting of Microsoft and IBM clients and servers. NetBEUI 3.0 is the Microsoft update of IBM's NetBEUI protocol included with Windows NT. (Strebe, 1998)

(4) NWLink. NWLink is Microsoft's implementation of Novell's IPX/SPX protocol stack used in Novell NetWare. IPX is an outgrowth of the XNS protocol stack that Xerox developed in late 1970's. Therefore, NWLink is IPX for Windows NT. IPX is the protocol; NWLink is the networking component that provides the protocol. (Strebe, 1998)

(5) DNS. Domain Name Service (DNS) is the TCP/IP network service that translates textual Internet network addresses into numerical Internet network addresses.

(6) DHCP. DHCP stands for Dynamic Host Configuration Protocol, which is a method of automatically assigning IP addresses to client computers on a network.

(7) PPP. PPP stands for Point-to-Point Protocol. PPP provides mechanisms for encrypting logon requests and for supporting transport protocols other than TCP/IP. PPP is optimized for low-bandwidth communications and conveys data between communicating computers. PPP is the default method of making connections to and from a RAS (Remote Access Service) server. (Strebe, 1998)

c. Local Client Desktops

A client is a computer that relies on a server for logon validation and file storage. A client usually has some storage (hard disk space) of its own to contain program files, but the user's files are typically stored on the file server rather than to the client. Unlike most servers, the client computer executes programs for the user and interacts directly with the user. (Strebe, 1998)

(1) Computers. Gateway GP6-400 22 P2, 400Mhz CPU, 6.4G hard drive, 64M RAM, 24x CD-ROM, 3.5" drive.

(2) NIC. 3Com Fast Ethernet Link XL NIC 3C905B-TX.

(3) Monitor. 17" screen (15.4" viewable).

(4) Operating System. Windows NT Workstation.

(5) Office Software. Microsoft OfficeProfessional97.

(6) IP Address. Obtained from NAS Fallon DHCP server.

d. Client Laptops

(1) Notebooks. Gateway, Solo 2500 9 P2 266Mhz CPU, 2 G hard drive, 64 M RAM.

e. Server

The hub is the physical central point of most networks, but the server is the central point of network communications. The computers on the network rely on the server to store data and to validate logon requests. The server is connected to the network as any other computer is, but it is the server's software that makes the server special. The server is usually more powerful than the other computers on the network. (Strebe, 1998)

(1) Computer. Gateway NS 7000 P2 333MHZ CPU, 2 hard drives, each 9G, 128 M RAM.

(2) Monitor. 17" screen (15.4" viewable).

(3) Operating System. Windows NT Server, with Service Pack 4.

(4) License agreement. Per server.

(5) Level of fault tolerance. Disk mirroring (RAID Level 1). Disk mirroring is the process of performing every write operation in a file server to two identical disks. Then, in the event that the primary disk fails, the secondary disk is ready to take over instantly as an exact copy.

(6) Fault Recovery. Tape backup.

(7) Domain. Saint.

(8) PDC. PDC stands for Primary Domain Controller. The PDC is the domain server that contains the master copy of the security, computer, and user accounts databases and that can authenticate workstations. The PDC can replicate its

databases to one of more backup domain controllers. The PDC is usually also the master browser for the domain. (Strebe, 1998)

(9) Master Browser. The computer on the network that maintains a list of computers and services available on the network and distributes the list to other browsers. (Strebe, 1998)

(10) IP Address. Static, obtained from NAS Fallon AIS Office.

(11) DNS. Not used.

f. Remote Access Server

(1) Computers. Gateway GP6-400 22 P2, 400Mhz CPU, 6.4G hard drive, 64M RAM, 24x CD-ROM, 3.5" drive, 3Com Fast Ethernet Link XL NIC 3C905B-TX.

(2) Monitor. 17" screen (15.4" viewable).

(3) Operating System. Windows NT Server.

(4) Office Software. Microsoft Office Professional 97.

(5) IP Address. Obtained from NAS Fallon DHCP server.

(6) BDC. BDC stands for Backup Domain Controller which is a server that contains accurate replications of the security and user databases to authenticate workstations if the PDC does not respond. (Strebe, 1998)

(7) RAS. Set up DHCP for client TCP/IP addresses, and used PPP for connection.

(8) Physical location. RAS was stationed in the Operations Department and was never turned off. The computer was used daily by Operations personnel as a workstation.

(9) Security. Access and content security through Windows NT Server software are discussed in a section of Appendix C - Web site Security.

(10) Tape Backup. One tape slot for backup.

g. Remote clients

(1) Computers and operating systems: Various computers including laptops.

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IV. INTRANET

A. INTRODUCTION

The World Wide Web (WWW) appeals to end-users partly because it employs intuitive technologies, such as searching and hyper-linking, which makes it easy to find information. The Web also appeals to developers, IT professionals, and others because it takes advantage of open, platform-independent standards that reduce administrative complexity and costs on both the client and the server. (Intranet)

Recently, private organizations have been deploying the open technologies invented for the World Wide Web across existing network infrastructures. These internal Webs, called Intranets, hold great promise for internal publishing and collaboration. Intranets are inexpensive and easy to establish, and most companies can run their Intranet Web on existing local area networks without the security concerns of the public Internet.

Intranets are private networks built using Internet standards and protocols. They bring the intuitive navigational interface of the World Wide Web to the information and services stored on a corporate, or in this case squadron, local area network. Intranets are attractive because they can lower the administrative costs of maintaining an internal network and at the same time improve worker productivity by giving users more efficient access to the information and services they need. This attractive combination is leading organizations to adopt Intranets at unprecedented rate. (Intranet)

The most basic type of Intranet is referred to as a simple Intranet. From the simple Intranet more sophisticated Intranets can be developed. This thesis project began by designing a simple Intranet. Once a basic Web was in place, additional functionality such as form generation, database connectivity and GroupWare were researched and implemented to varying degrees. This chapter describes the basics of Intranet design and will provide the essentials for understanding Chapter VII, Prototype Development.

B. THE SIMPLE INTRANET

1. Overview

Although the appeal of Intranets is fairly obvious, the process of implementation is not. Since hiring outside contractors and designers to develop Intranets for naval aviation squadrons can cost a great deal of money and be difficult to manage once developed, it is not a realistic option. The alternative is to develop a small system that is built and maintained by members of the squadron. The resultant simple Intranet can deliver real value in the form of improved information sharing with relatively low setup and administrative costs. Simple Intranets built at low cost with familiar tools can improve an organization's ability to share information and provide a first step toward implementing more sophisticated Intranet solutions. (Intranet)

Note: It is important at this juncture to point out that the information contained in this chapter concerning Intranet software was obtained mainly from Microsoft reference material. Therefore, the information is greatly swayed to that company's products. Since the work involved in this thesis did use Microsoft products, it is pertinent to address the capabilities of those various software products. However, there are many vendor product development tools to choose from in the marketplace and the reader is encouraged to do additional research on alternative options.

2. Simple Intranet Benefits

A simple Intranet allows organizations to take advantage of the promise of the Intranet at the team or departmental level with current technologies. These grassroots Webs deliver benefits both as solutions in and of themselves and as a first step to a more comprehensive Intranet deployment. (Intranet)

a. Improved Information Sharing

The primary benefit of an Intranet is improved information sharing. In a modern organization, access to information is a key to success. The Intranet continues to evolve toward the more intuitive information managing that began with the shift from a command line to a graphical user interface. The Web browser metaphor provides several improvements over previous models: (Intranet)

(1) Linking. The ability to connect related documents and data through hyperlinks makes navigating through large pools of information much more efficient. The graphical, point-and-click metaphor of the Web is easily grasped by all levels of users.

(2) Search engines and automatic indexing. Users can quickly find specific information by subject or author on broad topics even if the Web lacks clear organization.

(3) Common point of entry. A subtle but important benefit of an Intranet is the ability to provide a common point of entry to all information relevant to a team or department. For example, users no longer have to remember whether information is stored on a file server or distributed as a hard copy memo.

A simple Intranet lets a team or department take advantage of these simple yet powerful improvements to better manage the flow of information among members. (Intranet)

b. Low Initial Investment

Without careful planning, the benefit of an Intranet can be quickly overshadowed by the cost. A simple Intranet allows a team or department to take advantage of the improved information sharing offered by the Web metaphor with relatively low incremental investment, using existing hardware and out-of-the-box software. For organizations that have an existing LAN and are standardized on Office 97, a simple Intranet can be built at very little incremental cost: (Intranet)

(1) Browser. Microsoft Internet Explorer 4.0, Free download from Microsoft Web site and accompanies many of the Windows Operating Systems.

(2) Web server. IIS 4.0, Free download from Microsoft Web site as part of NT Option Pack 4.

(3) Web Development. Microsoft FrontPage 98, approx. \$100 for FrontPage98 CD-ROM.

Since simple Intranets are by definition limited in size and scope, many of the difficult issues associated with more sophisticated Intranet solutions, such as firewalls and security, custom application development, integrating legacy systems, do not arise. This helps keep both initial investment and ongoing administrative and support costs and effort low. (Intranet)

c. Easy to use software tools

Because they are often built and managed by the groups that use them, simple Intranets require tools that allow all users to contribute content easily, as well as tools that make local management of the Web possible. Office 97 and FrontPage are well suited for building and managing these Intranet Webs. (Intranet)

Office97 software provides a rich set of tools for end users to create content in HTML or in native Office formats optimized for online use. FrontPage offers a WYSIWYG (What you see is what you get) authoring environment for more sophisticated Hypertext Markup Language (HTML) authoring and intuitive tools for managing a Web site. HTML, or hypertext markup language, is a programming language used to build Web sites. It contains standard codes, or tags, that determine how a Web page looks when your browser displays it. HTML tags also make possible the hyperlinks that connect information on the World Wide Web.

Simple Intranets are most effective when all members of the user community can contribute content. The benefit of an Intranet to an organization is diminished if extensive retraining or administrative support is necessary to build and maintain the Web.

Organizations that have standardized on Office can leverage their existing investment while taking advantage of the new model of the Intranet. Office 97 extends familiar desktop tools to the Intranet, with features such as the Web Page Wizard in Microsoft Word and the ability to automatically save any document in HTML.

FrontPage allows sophisticated end users to manage a Web site with little or no assistance from IT professionals. The intuitive interface of the FrontPage Explorer, tools that automate administrative tasks such as updating hyperlinks, and drag and drop integration with Office make FrontPage an ideal tool for locally administered Webs. The FrontPage 98 Explorer Navigation View allows drag and drop administration of the Intranet's hierarchy. FrontPage updates all the links and page names on the fly.

d. Rich Content Authoring

Ultimately the value of an Intranet is determined by the quality of the information it contains. Even on a simple Intranet, users need to be able to create rich content that goes beyond the capabilities of static HTML.

Active Document technology allows users to view Office 97 documents within Microsoft Internet Explorer or another compatible browser. Office 97 file formats have been enhanced for use online, with features such as the Document Map in Word for easier viewing, and the online comments and revision tools in Word and Microsoft Excel for collaborative authoring.

In addition to a full set of HTML authoring tools, FrontPage provides simple programming tools that help nonprogrammers create richer, more useful Webs. FrontPage Components are pre-built programs that provide functionality such as searching, tables of contents, and page formatting. Also, FrontPage has FrontPage Active Elements, which bring even more sophisticated functionality to Web sites through Java Applets and ActiveX Controls.

e. Scalability

Many organizations set up simple Webs as a first step toward a more sophisticated Intranet deployment. A local Web for a particular department can be expanded and enhanced to create a centralized Web for an entire organization. Alternately, several grassroots Webs can be brought under centralized management to create the larger Web.

In addition to leveraging the actual files, organizations benefit from the learning that takes place when a group starts using a simple Intranet. Workers become accustomed to using the Intranet for simple information sharing and incorporate it into their working day. Piloting simple Intranets allows organizations to gain insights that make their higher level solutions more effective.

A simple Intranet is the ideal first step toward a more sophisticated Intranet solution. Not only the learning and experience of the group but also the Webs themselves can be leveraged when creating a centralized Intranet for the organization. It is important, then, that the tools used to build a simple Intranet provide a path for scaling up to a more comprehensive solution.

C. INTRANET DEVELOPMENT BASICS

1. Overview

Teams or departments who want to take advantage of the promise of the Intranet today can build simple Webs that improve the quality and efficiency of the basic information sharing that happens in all organizations. As a first step, teams can deploy a simple Intranet that serves as a more effective tool for storing shared files and data.

At its core, an Intranet is a collection of files stored on a server. A navigational layer is placed on top of this pool of content to provide structure, organization, and searching capabilities. (Intranet)

2. Simple Intranet Structure

Users in a group can create documents in the content layer using products such as Office 97, and then view it using a browser such as Microsoft Internet Explorer. A designated member of the group builds the navigation layer and manages the overall Intranet using any of a variety of site management tools such as FrontPage. (Intranet)

a. Content Layer

In a simple Intranet, the content is created by the members of the team or department using Office97 applications. The documents themselves can be HTML documents, Word files, Excel spreadsheets, and so on. The combination of Office 97 and Microsoft Internet Explorer allows users to include a variety of rich content types in their Web. (Intranet)

b. Navigation Layer

The navigation layer of the simple Intranet consists of HTML pages that provide broad categories for information, and the Web's search service. This layer is built and maintained by a designated person called the Webmaster. This person need not be an IT professional as any advanced user can manage a Web site using the Web management tools.

c. Publishing and Searching

The value of an Intranet depends on up-to-date, relevant content; users need an easy way both to publish their content to the Web and to gain access to information once it is posted.

Because an Intranet is essentially a collection of files stored on a server, publishing content consists of saving a document to the server, just as users ordinarily would. From a user's perspective, the simplest structure is for each user to have a designated folder where documents are to be saved.

The designated Web manager then supplies the navigational layer that helps others find the information they need, creating hyperlinks to high priority documents or grouping sets of documents in one of the following ways:

(1) By person. Users can navigate directly to a folder to see the collection of documents that one person has created. This works particularly well in small groups, when users typically know what their colleagues are working on.

(2) By subject. Organization is based on the hyperlinks and category pages created by the Web manager. These typically are the most frequently used or most important subjects for the group.

(3) By searching. Users who can't find the information they need by using the structure of the intranet can use the search capabilities provided by the Web's search engine to find the documents they need. Search tools such as the FrontPage Search Component and the Office FindFast Web Query automatically generate hyperlinks to documents that meet the parameters of the user's query.

The Intranet thus functions as a more efficient version of a traditional file server. The underlying folder structure is established to fit the needs of the team members who are publishing to the Web site. For them, publishing to the Web site is as easy as saving a file to their hard drive. The Intranet front-end provides a much more intuitive and friendly interface, essentially hiding the underlying folder structure from the casual consumer who just wants to find the desired information.

D. SCALING UP

1. Overview

Simple Webs are ideal first steps to building larger, more sophisticated Intranet solutions. There are several criteria for determining when an organization needs to scale up from a grassroots Web to a more centralized, sophisticated Intranet which are described. (Intranet)

2. Size

Simple Webs are ideal for small teams or departments, but as the number of people who use the Web and the volume of content grows, more sophisticated tools are needed. As the Web grows, users will need a more robust solution. For example, the performance and features of Microsoft Internet Information Server (IIS) running on the Microsoft Windows NT operating system can provide that more robust system. The FrontPage server extensions make it very easy to use Web Server IIS. (Intranet)

3. Integration

Simple Webs are designed as standalone tools. However, organizations may want to begin integrating their Webs with other network services for more sophisticated functionality. For example, organizations can use the combination of Microsoft Outlook97 desktop information manager and Microsoft Exchange Server to create powerful GroupWare solutions for their Intranets. Note: The customers Intranet utilized Novell GroupWise for their GroupWare solution and is described later in this chapter.

Other examples include using Excel 97 as a client for data pulled from a Microsoft SQL server, or taking advantage of the integration between Microsoft Access 97 and IIS to create dynamic, Web-based database solutions. Microsoft provides a rich set of integrated technologies to help users increase the sophistication and usefulness of their Intranet. (Intranet)

4. Applications

Simple Intranets are ideal solutions for publishing and sharing information. However, organizations may ultimately decide to use their Intranets as platforms for

building custom applications. Intranets provide an efficient way to deliver client/server applications to an entire organization.

Developing applications requires the robust features of IIS and related server technologies. Microsoft technologies such as ActiveX and the Distributed Component Object Model provide organizations with a rich platform for developing sophisticated Intranet applications.

E. WEB BROWSER

1. Overview

A Web browser contains the basic software needed in order to find, retrieve, view, and send information over the Internet.(IE) This includes software that lets you:

(a) Send and receive email, messages worldwide nearly instantaneously. Note: GroupWise was selected as the email software and is discussed in later sections.

(b) Read messages from newsgroups, forums about thousands of topics in which users share information and opinions.

(c) Browse the World Wide Web (or Web) to find a rich variety of text, graphics, and interactive information.

(d) A browser such as Microsoft Internet Explorer contains the tools you need to handle FTP. File transfer protocol (FTP) is a protocol that allows files to be transferred and downloaded from other computers. So with Internet Explorer, you can download any file available on the Internet.

Microsoft Internet Explorer (IE) 4.0 was chosen by the customer for use on all client computers in the command. IE 4.0 was downloaded for free from the Microsoft Web site. IE 4.0 also includes additional Internet-related software. This Internet related software is primarily used when accessing the Web, but some functions of the software could be used for Intranet functions in future development. (IE)

2. Features

a. NetShow server

This allows you to see and hear live and recorded broadcasts such as concerts or breaking news with synchronized audio, graphics, video, URLs, and script commands. Streaming technology allows you to see or hear the information as it arrives instead of having to wait for the entire file to download. (IE)

b. NetMeeting conferencing software

With a sound card, speakers, and a microphone, you can talk to others worldwide, from family to colleagues, using NetMeeting. Add a Windows-compatible video capture card and/or camera to see them, too. Exchange pictures and draw diagrams on an electronic whiteboard, communicate with text-based chat, transfer files, and share applications. (IE)

c. ActiveX controls

ActiveX technology allows authors to develop innovative, highly interactive Web sites. ActiveX Controls are the software components that run behind the scenes in Internet Explorer so that these sites come alive for you. (IE)

d. Chat

This program lets you converse online in real time with one or more people. You decide how your message is displayed text only or text with graphics. You can send and receive sounds, files, and "hot" links of e-mail addresses, Web pages, and newsgroups. (IE)

e. ActiveMovie application programming interface

ActiveMovie allows you to experience television-quality video and CD-quality audio, while minimizing file size and download time compared to other video and audio formats. By using "progressive downloading," ActiveMovie lets you start playing an audio or video clip while it's still downloading. (IE)

f. Active Channel

Active Channel Web casts enable dynamic information to be sent regularly to your computer. They automatically transmit content that fits your interests—everything from Disney entertainment to stock quotes. Use the Channel bar to select your favorite topics, and Internet Explorer 4.0 gets the information, so you can read it whenever you want. (IE)

g. Subscriptions

This feature delivers preferred information straight to your desktop, when you want it, in the way you want it. To subscribe to a Web site, select the site and specify when you want the information updated and how you want to be notified, such as through an e-mail message. Internet Explorer does the rest. Then you can browse the content offline. (IE)

h. Dynamic HTML

Internet Explorer 4.0 supports this programming language, which makes enticing, unique, fun, and fast-downloading Web pages possible. The pages download quickly because they are created using lightweight HTML instead of heavy-duty graphics. Round trips to the server are minimized, which means faster browser performance on your desktop computer. (IE)

F. WEB SERVER

1. Microsoft Internet Information Server

Microsoft Internet Information Server (IIS) is the Web server integrated with Windows NT Server that makes it easy to publish information and bring business applications to the Web. Although Windows NT Server came with IIS 3.0, it was not used. Instead, the most up to date server software, IIS 4.0, was used as it was available as a free download from the Microsoft web site with the NT Option Pack. (Option)

2. Setting Up a Web Site

This section describes how to use the Default Web Site included with IIS to quickly set up a Web site. To establish a Web site by using the IIS defaults:

(1) Create a home page for your Web site using Web development software.

(2) Name your home page file Default.htm. If you want to use another name, you must start Internet Service Manager, click Default Web Site, click the Properties button on the Toolbar, choose the Documents property sheet, and add the file name to the top of the list of enabled default documents.

(3) Copy your home page file into the Default Web Site home directory for IIS. The default home directory offered in Setup is "inetpub\wwwroot".

(4) If your network has a name resolution system, then visitors can simply type your computer name in the address bar of their browser to reach your site. If your network does not have a name resolution system, then visitors must type the numerical IP address of your computer.

(5) A URL, or uniform resource locator, is the address of an Internet or Intranet file. Usually it consists of four parts: protocol, server (or domain), path, and filename. Sometimes there's no path or file name. Here's an example: <http://www.microsoft.com/magazine/tips/default.htm>, where *http* is the protocol, *www.microsoft.com* is the server, or domain. (could also be an IP address), */magazine/tips/* is the path, and *default.htm* is the filename. (Option)

3. Web Site Content

Files need to be placed in directories on the Intranet Web site so that clients can view the files with a Web browser, such as Microsoft Internet Explorer. You can make available, or *publish*, documents in HTML format that include text, graphics, or even animations and videos. Applications can also be installed on the Web site so that personnel can fill out forms.

Content should be placed in folders through a managed plan so that users can add and update content in their specific area of the Intranet. Keeping well managed folders also enables the Web master to provide a sharing and security plan for all the content. (Option)

4. Web Applications

The Windows NT Option Pack provides a platform for building Web applications for the Intranet. Web applications can be delivered as a combination of Web pages that provide the user interface to the application and ActiveX components that encapsulate business logic and provide access to the databases where critical business information is stored. With Active Server Pages, HTML pages can be created with embedded scripts that are processed by the Web server instead of by the browser. With Internet Information Server, applications can be deployed on a fast, easy-to-administer, and secure Web server.

Internet Information Server supports Common Gateway Interface (CGI) applications, Internet Database Connector (IDC) applications, and Internet Information Server Application Interface (ISAPI) applications. (Option)

5. Server Administration

The IIS default settings are adequate for many situations, but it may be necessary to change these defaults for varying situation. You may be able to provide additional value, better performance, and improved security by making adjustments to the default settings. There are many functions that are performed through server administration.

- (1) Define Web and FTP sites and basic operation instructions.
- (2) Set up WINS or DNS name resolution.
- (3) Configure applications.
- (4) Protecting server, content, and applications through security functions.
- (5) Log Web site traffic.
- (6) Tune for best performance.
- (7) Monitor performance problems
- (8) Provide fault tolerance and load balance.(Option)

G. FRONTPAGE98 WEB DEVELOPMENT AND MANAGEMENT

This section will discuss FrontPage Editor, FrontPage Explorer and FrontPage Server Extensions and some of their basic features.

1. Microsoft FrontPage Editor

The FrontPage Editor is a tool for creating, designing, and editing World Wide Web pages. As you add text, images, tables, form fields, and other elements to your page, the FrontPage Editor displays them as they would appear in a Web browser. A more complete description of this tool can be found in Appendix D - FrontPage Editor Key Features.

You do not need to learn HTML to use the FrontPage Editor because it creates all the HTML code for you. The FrontPage Editor generates all the popular HTML tags, including extensions such as cascading style sheets, frames, and ActiveX Controls.

If you want to edit the HTML code directly, you can use the FrontPage Editor's HTML view. In this view, you can enter text, edit HTML tags, and use standard word-processing commands such as cutting, pasting, and find and replace. Although it is a powerful tool, the FrontPage Editor is easy to use because of its familiar, word-processor like interface. (Editor)

2. Microsoft FrontPage Explorer

FrontPage Explorer is a tool for creating, organizing, administering, and publishing FrontPage webs. Using the FrontPage Explorer, you create the structure or layout of your Web site, arrange its files and folders, import and export pages and files, test and repair hyperlinks, administer access privileges, and launch the FrontPage Editor to design and edit the contents of your Web pages. You also use the FrontPage Explorer to publish completed FrontPage webs on your computer, your organization's Intranet, or the World Wide Web. A more complete description of this tool can be found in Appendix E - FrontPage Explorer Key Features.

A FrontPage web is a collection of HTML pages, images, documents, and other files and folders that make up a Web site. Authors can create, delete, open, edit, and close FrontPage webs using the FrontPage Explorer and FrontPage Editor on a client computer. FrontPage webs can be stored on a remote Web server, a Web server running on the same computer as the client program, or in the client computer's file system.

A FrontPage web also contains a number of support files that provide added functionality with sophisticated features such as navigation bars, hyperlink recalculation and repair, full text index generation, consistent design elements from themes, automatic table of contents generation, and built-in forms handling. (Explorer)

3. Microsoft FrontPage Server Extensions

The FrontPage Server Extensions are a set of programs on the Web server that support: Authoring FrontPage webs, Administering FrontPage webs, and Browse-time FrontPage web functionality. A more complete description of these programs can be found in Appendix F - FrontPage Server Extensions and Appendix C - Web Site Security.

(1) Authoring FrontPage webs.

When an author moves a page from one folder to another in a FrontPage web, the Server Extensions automatically update all hyperlinks to that page from every other page and Microsoft Office document in the FrontPage web, directly on the Web server machine.

(2) Administering FrontPage webs.

A FrontPage web administrator can specify which users can administer, author or browse a FrontPage web.

(3) Browse-time FrontPage web functionality.

Users of a FrontPage web can participate in a discussion group. The Server Extensions will maintain an index of hyperlinks to articles in the discussion, separate discussion threads, tables of contents, and search forms to locate pages of interest. (Extensions)

H. MICROSOFT OFFICE97

1. Microsoft Office97 Overview

Office 97 seamlessly integrates Web technologies to make the promise of the Web relevant to today's businesses. Office 97 provides innovative tools for finding information, publishing documents, and collaborating interactively with others. (Office) The customer chose Microsoft Office 97 software when it established the LAN and thus it was the product for providing the content to the Intranet. A more complete description can be found in Appendix G - Microsoft Office97 Key Features.

a. Integration with Internet Explorer

Microsoft Office 97 integrates seamlessly with Microsoft Internet Explorer 3.0 or later to allow users to easily access, view and edit information contained in Office documents regardless of where it resides. (Office)

b. Web Find Fast

Office 97 allows users to use the navigation and searching metaphors of the Web to quickly find what they are looking for. FindFast technology allows full-text searching of both HTML and Office documents on a company network. (Office)

c. Hyperlinks

Hyperlinks between documents make it easier for the reader (or author) to go to related information. These hyperlinks can refer to other Office documents, HTML files, or any file with a recognized address through a fully qualified path using a URL or FTP address. (Office)

d. Web Toolbar

To make it easier for users to use hyperlinks to move between documents, the Web toolbar is shared by Microsoft Access 97, Microsoft Excel 97, PowerPoint 97, and Word 97. (Office)

e. Opening from or saving to a URL

Office 97 gives users the flexibility to open files residing not only on the corporate network, but also on Web servers accessible through HTTP or FTP servers. In addition, once users have created Office documents, they can save them to URLs using the Save command. (Office)

f. Online Publishing

Working effectively in a connected environment means that users must be able to publish information online as easily as they now print and save documents. Office

97 extends familiar ways of publishing information to the online environment in several ways.

Microsoft Office is designed to provide the flexibility to publish information in a variety of formats. Every Office 97 application provides built-in support for viewing and creating HTML. Now, users can create rich content for the Internet or an Intranet using the tools with which they are most familiar.

To make it easy for all users to navigate to and share Office documents, Microsoft provides (or will provide) free file viewers for Microsoft Word 97, Microsoft Excel 97 and PowerPoint 97. These viewers enable users to view and print Office documents without requiring the applications to be installed. (Office)

2. Microsoft Access97

Microsoft Access 97 makes it easy to create Web-based queries that allow users to pull real-time database information using a browser on their desktop. In addition, Access 97 includes additional features that bring database information and the Web closer together without complicated programming. (Access) A more complete description can be found in Appendix H - Microsoft Access97 Key Features.

a. Hyperlink Datatype

The ability of Microsoft Access 97 to help users organize and manage data further enhances the value that stored hyperlinks provide. Databases provide the structure in which to store related pieces of information and the tools to find and manage that data easily. But gathering and entering all the pertinent data can be an arduous task. Combining the powerful organizational ability of Microsoft Access 97 with the low-maintenance data collection mechanism that hyperlinks offer makes for the best of both worlds. Hyperlinks provide an easy-to-locate single-click access to relevant data, requiring only minimal data entry. (Access)

b. Hyperlinks in Office Documents

Microsoft Access supports hyperlinks that go to URLs as well as to locations in other Office 97 documents. Hyperlinks also allow connectivity between various objects within a Microsoft Access 97 database. Entire databases can be built using hyperlinks as the mechanism to connect objects. This method alleviates the

necessity to create and then execute Visual Basic for Applications code, as was previously required, offering users an added performance benefit. (Access)

c. Save to HTML

In Microsoft Access 97, users can share static views of their data on the Web by clicking the Save As HTML command. Microsoft Access outputs table, query, and form datasheets as well as formatted reports directly to HTML.

The output of static data from a database is extremely useful, especially when the information seldom changes. However, today's users are interested in more than that; they need to publish information from a dynamic data source, so that users can return to the same location and always receive the latest information.

Leveraging the Internet Database Connector functionality that is native to Microsoft Internet Information Server, Microsoft Access 97 provides an easy way for users to share their structured data in a workgroup or over the Internet.

Users select the objects they want to publish and provide a few basic pieces of information, and Microsoft Access 97 does the rest. Microsoft Access creates the query files (ICD files) containing information about the view of data to publish, and the templates (HTX files) that contain information about how to format the information that is returned. (Access)

d. HTML Importing and Linking

Most users of Microsoft Access initially import their information from another format: a Microsoft Excel spreadsheet, a delimited text file, or a client/server database such as a Microsoft SQL server. The recent emergence of HTML for distributing data has led to improvements in the Import/Export Wizard. In Microsoft Access 97, not only does the wizard read and import delimited and fixed-width text files, but it also imports data from HTML tables.

Typically, information residing on an HTML page changes regularly, but importing the information from the HTML page over and over again is not the most efficient way to get that information into Microsoft Access for further analysis. For that reason, Microsoft Access 97 allows users to link to an HTML table on any Web page. This read-only link makes it easy for users to incorporate the rich data from the Web into their existing Microsoft Access applications. (Access)

3. Microsoft Word97

A more complete description can be found in Appendix I - Microsoft Word97 Key Features.

a. Online Layout View

Word 97 provides a new online layout view that is optimized for on-screen reading. What works best for reading printed pages is often different from what is best for reading online. For example, it is useful to see recurring headers and footers in printed output, but not as useful online. Online layout view provides the best on-screen display of documents. (Word)

b. Document Map

The Document Map in Word 97 allows users to move around documents more easily. A split screen displays a hyperlink outline of a document in the left pane and the document text in the right pane. The Document Map gives users one-click access to points of interest, and serves as a "you are here" road map. (Word)

c. Navigation Tools

Word 97 combines the intuitive navigation of the scroll bar with the power of the Find and Go To dialog boxes. Word 97 contains a Document Browser accessible from the scroll bar. The browser lets users choose an element by which to navigate. Users can browse by page, section, comments, footnote, endnote, field, table, picture, or headings. (Word)

d. Web Page Authoring

In Word 97, the Internet Assistant is built directly into the product. In addition, Word 97 extends Internet Assistant functionality to allow users to create sophisticated and powerful Web pages without having to learn HTML. Word 97 supports the following HTML tags: backgrounds, bullets, horizontal lines or rules, insert menu, pictures, video, sound, marquee text, blinking text, and HTML forms. Word 97 provides a consistent approach to forms design regardless of whether users are creating forms in a standard Word document or an HTML document. (Word)

e. Animated Text

Animated text helps make documents come alive. With animated text, users can make their text blink, march, shimmer, or sparkle. Text animation is only for online use and is not visible in printed documents. (Word)

f. Background Picture Rendering

Word 97 provides an optimal online browsing experience by rendering pictures in the background. This allows users to browse through text and other document elements without waiting for the entire document to download. (Word)

g. Compressed Graphics

Word 97 now automatically compresses pictures and graphics inserted into documents. In addition, Word natively stores JPEG images and converts all raster formats to PNG, a new compressed format. (Word)

h. Web Page Wizard

Word 97 includes a Web Page Wizard that allows users to select the type and style of the page they want to create. The Web Page Wizard provides users with content and design help so that they can successfully create a visually compelling page that effectively communicates the information they want to share. (Word)

i. Online Content

In addition to the built-in collection of Web-specific elements, users of Word 97 have access to the Microsoft Web site to choose from a larger collection of Web-authoring templates, images, and tools. (Word)

j. Support for HTML Tags

Word 97 provides WYSIWYG support for authoring Web pages with commonly used tags such as tables, fonts, graphics, blinking text, and background sound. Word 97 supports more than 80 HTML tags. (Word)

4. Microsoft Excel97

A more complete description can be found in Appendix J - Microsoft Excel97 Key Features.

a. Web Form Wizard

Today, many Web pages use forms to collect user information. For most spreadsheet users, creating an online form and retrieving the information is difficult because it requires complicated HTML code; and submitting information to a Web server is no easier. With the Web Form Wizard, Microsoft Excel 97 makes it easy for users to submit information from a form created in Microsoft Excel directly to a Web server. Once on the Web server, administrators can retrieve the information regardless of their operating system. (Excel)

b. Support for HTML Tags

Microsoft Excel 97 introduces new HTML tags for spreadsheet formatting, formulas, AutoFilters, and PivotTables to bring Microsoft Excel functionality to HTML documents. Users viewing these tags in incompatible browsers see the underlying data in a simple HTML table. (Excel)

c. URLs in Formulas

Microsoft Excel makes it easy to connect to important data no matter where it resides. Microsoft Excel users can create formulas with links to a range of cells in a separate workbook. This workbook can reside either on a desktop or on a corporate network. Now Microsoft Excel extends this capability to a workbook located on a Web server, so users can specify URLs in their formulas. (Excel)

d. Web Queries

Much of the data available on the Web is dynamic and changes frequently. As more data becomes available online, there will be an increasing need for direct access to this data. In Microsoft Excel 97, Internet data can be retrieved by running queries that import specified data into a spreadsheet on a regular basis. In addition, the imported data

can be updated regularly on the same worksheet and used for calculations or in analysis. (Excel)

5. Microsoft PowerPoint97

Microsoft PowerPoint 97 makes giving presentations over an Intranet or the Internet a reality. Using the Save As HTML Wizard, presenters can save their presentations as HTML pages with universal navigation bars so that the virtual audience can move logically through the presentation. In addition, Microsoft PowerPoint 97 makes it easy to import HTML information from the Intranet while creating a presentation, gives users the ability to save their presentations to the intranet in native PowerPoint presentation file format, and much more. (PowerPoint) A more complete description can be found in Appendix K - Microsoft PowerPoint97 Key Features. (Excel)

a. Slide Finder

The number one request from the PowerPoint Wish Line is the ability for users to quickly find and reuse slides from existing presentations without browsing vast corporate servers. Users can use the new Slide Finder to instantly preview and open PowerPoint files by keeping frequently used presentations in the list of favorites. In addition, it allows users to easily browse slides in others' presentations, and insert specific or entire sets of slides from these existing presentations. (Excel)

b. Every Type of Output

PowerPoint 97 provides users with every type of traditional presentation output option users still need to be able to produce slides, black and white and color overhead slides and handouts, speaker's notes, and on-screen electronic presentations in meetings and kiosks. In addition, PowerPoint now supports users who want to deliver virtual presentations over the Internet. (Excel)

c. Intranet/Internet Viewer

Users can save presentations directly to an http or ftp server and freely distribute PowerPoint Viewers on their servers to allow those who don't have PowerPoint to view presentations. The improved PowerPoint Viewer for Windows 95 supports

password protection for delivering presentations in kiosks, and supports hyperlinks to URLs on an Intranet or the Internet. (Excel)

d. Home Page Template

Users can use the Home Page option in the enhanced AutoContent Wizard to step through everything they need to do to create a personalized home page, complete with image maps and links with URLs of their favorite Web sites. (Excel)

e. Presentation Conferencing

Anyone who has been in a meeting via a conference call knows that visual aids could make those meetings much more effective. PowerPoint 97 lets users deliver their presentations over Windows NT-based networks, and now over the Internet. The Presentation Conference Wizard walks the presenter through setting up the connection to his or her audience, no matter where the audience is located. (Excel)

f. Save as PowerPoint Show

One of the most commonly requested improvements to PowerPoint was the ability to set presentations to launch directly into Slide Show when activated, instead of launching into Slide View. PowerPoint 97 makes this possible with the new .pps file format, which is now supported and available in the PowerPoint 97 Save As dialog box. (Excel)

g. Browse Mode

Users of PowerPoint are increasingly interested in presenter-less presentations, where the recipient is expected to self-navigate through a presentation in the absence of a presenter. Tools such as Pack and Go, Sound Narration and Save as HTML Wizard facilitate this kind of use. (Excel)

h. Save as Web Animation

PowerPoint provides an easy way to create and publish "live" animations and presentations for more interesting and interactive Web pages. Visitors view the special effects and presentations with the PowerPoint Animation Player, a free Internet

browser extension that instantly runs PowerPoint animations or presentations in a window on an HTML page. (Excel)

I. NOVELL GROUPWISE

1. Overview

Novell GroupWise was chosen as the GroupWare product and its implementation is described in Chapter 7, Prototype Development. Basic email protocols and definitions are provided. In addition, the basic GroupWise functions of email and collaborative tools are described.

2. Features

This section will describe the main functions that GroupWise provides the user in the way of email capability and associated collaborative tools. These functions include: writing and delivering messages; reading and responding to mail; using the daily planner to schedule self tasks and group meetings; using GroupWise while out of the office or remotely. A more complete description can be found in Appendix L - Novell GroupWise Key Features. All information contained in this section was obtained from Novell GroupWise Help. (Novell)

a. Sending Messages (Writing messages)

(1) Determine Which Type of Message to Send

Determine whether to send message as an email, an email with an attached file, appointment message, task message, note message, or phone message.

(2) Proofread a Message with GroupWise

Proofreading options included Spell Check, Thesaurus, and External word processor. (Novell)

b. Sending Messages (Delivering message)

(1) Get Messages to the Right People

(2) Make Urgent Messages Stand Out

(3) Keep My Messages Confidential

- (4) Write a Message Now and Deliver it Later
- (5) Route a Message or File to Several People Consecutively
- (6) Make Sure Everyone Got My Message (Novell)

c. Read mail (Get mail)

- (1) Open mail
- (2) Delete unwanted mail
- (3) Save mail (Novell)

d. Read mail (Respond to mail)

- (1) Send a reply
- (2) Accept or Decline an Appointment, Note, or Task
- (3) Delegate an Appointment, Note, or Task
- (4) Complete a Routing Slip
- (5) Forward a Message (Novell)

e. Using Daily Planner (tracking own schedule)

- (1) Set alarms
- (2) Schedule a personal appointment
- (3) Make a To-do list
- (4) Write notes to self
- (5) Look at a different date
- (6) Look at several days
- (7) Print your schedule (Novell)

f. Using Daily Planner (Scheduling meetings and appointments)

- (1) Schedule a Meeting or Appointment

Use the functions of Personal Groups and Public Groups, Busy Search, Auto-Date, Cancel or Reschedule a Meeting, Resources, and Information to schedule a meeting or appointment.

g. Take Care of Mail When I'm On Vacation

- (1) Forward My Mail (Rules)
- (2) Reply Automatically (Rules)
- (3) Delegate Appointments, Notes, and Tasks (Rules)
- (4) Give Someone Rights to Read My Mail (Access List)

h. Using GroupWise when away

- (1) Send Mail Using Remote
- (2) Get Mail from My Master Mailbox
- (3) Synchronize My Mailboxes (Novell)

J. WEB SITE SECURITY

This section describes some of the issues surrounding Web site security. The topics of general Web hosting and FrontPage on the Web server are briefly listed. A more complete description of this topic can be found in Web Site Security, Appendix C. All information contained in this section was obtained from the documentation that accompanied Windows NT Option Pack (Option).

1. General Web Hosting Security Issues

a. Protecting your computer from unauthorized users

b. Protecting your computer from programs that run on the host computer

c. FrontPage Security Strategy

2. FrontPage Security on IIS Systems

a. Windows NT Security Concepts

b. IIS Security Overview

- (1) IIS Authentication
- (2) The Anonymous Account
- (3) Basic Authentication
- (4) Windows NT Challenge/Response
- (5) Distributed Password Authentication
- (6) Windows NT Challenge/Response and Network vs. Local

Logon Rights

c. The FrontPage Server Extensions on IIS

- (1) The FrontPage DLLs
- (2) FrontPage Access Control List Settings
- (3) FrontPage and System DLLs
- (4) Virtual FrontPage Directories
- (5) Restricting Windows NT Account Lists
- (1) Making a Directory Unreadable

3. DOD Publicly Accessed Web Site Security Policy

In the research conducted, a well-defined policy concerning DOD Intranets was not found. There is however a DOD policy concerning publicly accessed Web sites (Policy). This section was added to enable a quick reference to that policy. To learn more about that policy, see DOD Publicly Accessed Web Site Security Policy, Appendix M.

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V. PROTOTYPE MODEL

A. INTRODUCTION

Prototyping consists of building an experimental system rapidly and inexpensively for end users to evaluate. By interacting with the prototype, users can get a better idea of their information requirements. The prototype endorsed by the users can be used as a template to create the final system.

The prototype is a working version of an information system or part of the system, but it is meant to be only a preliminary model. Once operational, the prototype will be further refined until it conforms precisely to users' requirements. Once the design has been finalized, the prototype can be converted to a polished production system.

The process of building a preliminary design, trying it out, refining it, and trying again has been called an iterative process of systems development because the steps required to build a system can be repeated over and over again. Prototyping is more explicitly iterative than the conventional lifecycle, and it actively promotes system design changes. It has been said that prototyping replaces unplanned rework with the planned iteration, with each version more accurately reflecting users' requirements. (Laudon, 1997)

2. STEPS IN PROTOTYPING

The four-step model of the prototyping process is shown in Figure 1.

1. Identify Basic Requirements

The system designer works with the user only long enough to capture the basic information needs.

2. Develop an Initial Prototype

The system designer creates a working prototype quickly.

3. Use the Prototype

The user is encouraged to work with the system in order to determine how well the prototype meets their needs and to make suggestions for improving the prototype.

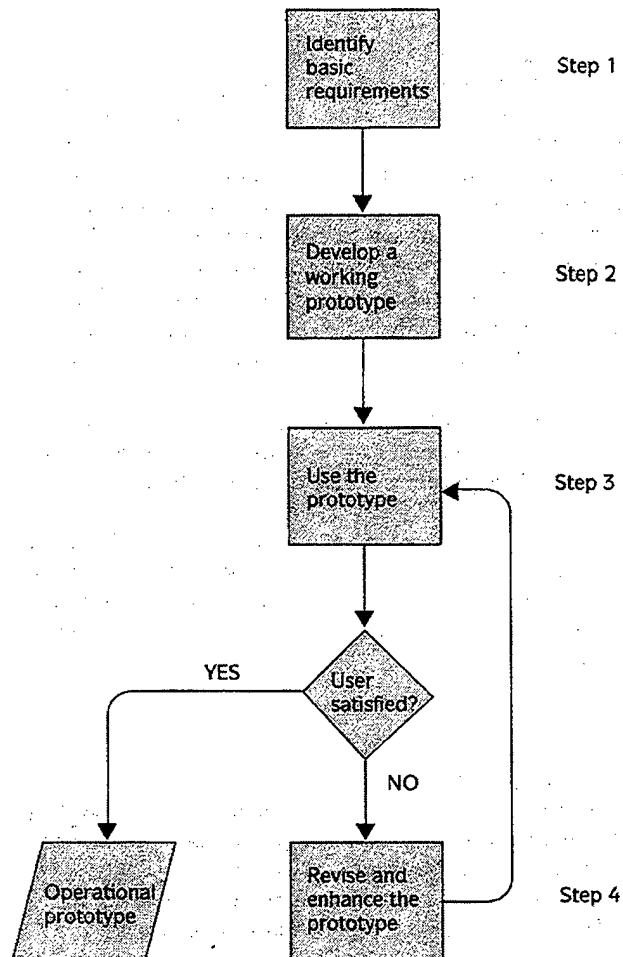


Figure 1. Prototyping Process (Laudon, 1997)

4. Revise and Enhance the Prototype

The system builder notes all the changes requested by the user and refines the prototype accordingly. After the prototype has been revised, the cycle returns to step 3. This cycle is repeated until the user is satisfied.

When no more iterations are required, the approved prototype then becomes an operational prototype that furnishes the final specifications for the application. Sometimes the prototype itself is adopted as the production version of the system.

3. DECISION FOR PROTOTYPING METHODOLOGY

Prototyping is most useful when there is some uncertainty about the requirements or design solution. Users may not be initially able to see how the system will work. This was the case with the customer. Most squadron members were used to working on their own client computers. After LAN implementation, those members had to get accustomed to sharing files and printers. This was a new process and a change had to be undertaken by all members to adapt to the technology. The idea of having a Web site and using GroupWare was even more novel. At the onset, there was very little notion on how the Intranet should be designed by the customer, however there was great expectation that the software could prove very beneficial in their daily work. It became apparent during the basic requirements cycle that rapid prototyping was an excellent methodology in designing the Intranet.

Prototyping is especially valuable for the design of the end-user interface of an information system. Prototyping encourages intense end-user involvement throughout the systems development lifecycle and is more likely to produce systems that fulfill user requirements. The customer did want to be involved in decisions on the look and feel as well as the content, so prototyping was the prime choice. Through close communications with the customer, the operational Intranet met all the customer's expectations.

Prototyping is better suited for smaller applications. The Intranet Web site for the customer was not a large system and therefore it lent well to prototyping. The basic premise in designing the Web site was to keep it simple. This allowed users to add information easily while allowing the Webmaster to effortlessly maintain the site.

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VI. IDENTIFICATION OF BASIC REQUIREMENTS

A. INTRODUCTION

During the many visits, phone calls and emails to VFC-13, a continuous analysis of requirements was conducted. Department Heads were interviewed to ascertain the various tasks that their departments performed and the resultant outputs that were produced. In addition, the Squadron Organizational Manual (SORM) was reviewed to identify tasks performed by individual job billets. Through the interviews and review of the SORM, specific tasks and end products were selected as the priorities to investigate for determination on possible Intranet incorporation. Therefore, only those tasks and products identified as priorities have been addressed, as identifying and researching every facet of the squadron was not feasible.

The selected tasks and end products were reviewed to determine how they were currently being performed. The ultimate objective was to determine if the process could be performed more effectively and efficiently through a well designed Intranet. Most tasks that involved a resultant published paper report were prime candidates to be incorporated into the Intranet Web environment in the form of linked HTML documents. Other tasks that were dynamic involving information routing, scheduling, notification and tasking were also researched to determine if those tasks could be performed effectively through the use of the GroupWare functions.

B. REQUIREMENTS

1. Overview

With the addition of the LAN came the ability to share files and printers. This laid the foundation for the development of the Web site and use of GroupWare. With the ability to utilize the Remote Access Server, Selected Reserve pilots from anywhere in the world would be able to read posted information on the Web site and interact with the squadron using GroupWare. Therefore, the different organizations within the command were examined to see which end products would be published onto the Intranet Web site for squadron viewing and which processes could be accomplished using GroupWare

functionality. Of course, ensuring that the Intranet was secure was a major concern and thus security requirements were addressed.

2. Intranet Web Requirements

The squadron utilized Microsoft Office Professional 97 to fulfill most of their software needs. There were, however, a few functions performed through the use of WordPerfect and Calendar Creator. Those software programs, however, were in the process of being phased out. At the time of Intranet development and implementation, most clients stored information on their desktop computer in the form of Word, Excel, or Access depending on the specific task requirement. This was due to the fact that the LAN was constructed in concert with the development of the Intranet. Therefore, the concept of file and print sharing or storing files on a Web server was new to most users at that time. The general practice at the squadron was for a member to author an end product, such as an instruction, the daily flight schedule, or a flight hour tracking database, on their client machine in either Word, Excel, or Access, respectively. These reports, spreadsheets or databases were kept on a client's machine. Once the information was processed into the correct format, the end products were either printed out and distributed for routing, saved on a floppy disk and routed, or sent as an email attachment for communication to an organization outside the command. Upon acquiring the necessary signature authority in the chain of command, the end product generally resulted as a finished product in paper format. The paper product was then either posted or placed in a binder.

One of the major elements of the requirements phase was to determine which resultant paper products could be saved as HTML onto the Intranet Web in addition to or in place of the way that it was currently being posted. In addition, there was a requirement to develop a system that could enable users to easily link files while allowing the webmaster to administer the Web site with minimal effort.

EXECUTIVE OFFICE	REQUIREMENT(S) FOR INTRANET WEB
Commanding Officer	<ul style="list-style-type: none"> • Squadron mission statement • Policy statements • Biography • Anymouse • Command Organizational chart
Executive Officer	<ul style="list-style-type: none"> • Policy statements • Biography
Officer in Charge	<ul style="list-style-type: none"> • Policy statements
Command Senior Chief	<ul style="list-style-type: none"> • Policy statements • Biography • Sailor of the Quarter and Year write ups • BEQ Instructions

Table 1. Executive Office requirements for Intranet Web

COLLATERAL DUTIES	REQUIREMENT(S) FOR INTRANET WEB
Educational Services Officer	<ul style="list-style-type: none"> • Links to Navy Campus • W. NV Comm College links • Embry-Riddle Links
FOD Prevention Officer	<ul style="list-style-type: none"> • FOD instruction
Hearing Conservation	<ul style="list-style-type: none"> • Local test dates
Military Cash Awards	<ul style="list-style-type: none"> • Program information
PSD Liaison Representative	<ul style="list-style-type: none"> • PSD monthly meeting minutes
Voting Assistance Officer	<ul style="list-style-type: none"> • Election schedules and registration information

Table 2. Collateral Duties requirements for Intranet Web

OPERATIONS	REQUIREMENT(S) FOR INTRANET WEB
Operations Department Head	<ul style="list-style-type: none"> • Operations monthly calendar • List of Operations instructions • Flight hour reports • Departmental Organizational Chart
Schedules Officer	<ul style="list-style-type: none"> • Daily flight schedule • List of flight schedules by month • Snivel listing
Detachment Coordinator	<ul style="list-style-type: none"> • Detachment checklist • Detachment schedule (long term and short fused)
SFARP Officer	<ul style="list-style-type: none"> • SFARP Syllabus • Lessons learned • SME lecture plans • SFARP Stan Items • Weapons School POCs
SFARP Subject Matter Experts	<ul style="list-style-type: none"> • Murderboard milestones • Preboard tracking sheets • Lecture highlights and unclassified updates
Airwing Training Officer	<ul style="list-style-type: none"> • Airwing training syllabus • Lessons learned • Bogey presentations • Stan items • NSAWC POCs
Information System Security Manager (ISSM) Officer	<ul style="list-style-type: none"> • ASDP • Hardware / Software inventory • Hardware / Software suggestions • Tech support / Troubleshooting
Intelligence Officer	<ul style="list-style-type: none"> • Current pubs and reading materials • SIPRNET references • Classified training issues
NWP Custodian	<ul style="list-style-type: none"> • List of publications • Post new pub arrivals
FRS Officer	<ul style="list-style-type: none"> • FRS FWT syllabus • Lessons learned • Stan items • FRS IP Roster
EW Training Officer	<ul style="list-style-type: none"> • EW equipment listing
Detachment OIC	<ul style="list-style-type: none"> • Detachment schedule • Detachment specific checklist • Detachment announcements and logistics

Table 3. Operations Department requirements for Intranet Web

ADMINISTRATION	REQUIREMENT(S) FOR INTRANET WEB
Administration Dept. Head	<ul style="list-style-type: none"> • List of all Instructions not posted by other depts. • List of all squadron notices • Monthly tickler report
Mobilization/Readiness Officer	<ul style="list-style-type: none"> • Mobilization instruction
RSTARS Officer	<ul style="list-style-type: none"> • SELRES activity report and tracker • Perstempo tracker
Personnel Officer	<ul style="list-style-type: none"> • Officer and Enlisted Roster
Legal Officer	<ul style="list-style-type: none"> • Instructions
Public Affairs Officer	<ul style="list-style-type: none"> • Recently published articles • Article suggestions / human interest • Hometown news release
Communications Officer	<ul style="list-style-type: none"> • Instructions
Awards Officer	<ul style="list-style-type: none"> • List of members receiving awards by month • Awards instructions • Awards work tracking sheet • Awards templates
Command Security Officer	<ul style="list-style-type: none"> • Instructions
Physical Security Officer	<ul style="list-style-type: none"> • Instructions
TQL Coordinator	<ul style="list-style-type: none"> • Instructions
First Lieutenant Officer	<ul style="list-style-type: none"> • List of repairs in works

Table 4. Administration Department requirements for Intranet Web

MAINTENANCE	REQUIREMENT(S) FOR INTRANET WEB
Maintenance Officer	<ul style="list-style-type: none"> • Aircraft status reports • Phase flow sheets • Aircraft configuration sheet • Quality Deficiency Report template • Contract news area

Table 5. Maintenance Department requirements for Intranet Web

SAFETY	REQUIREMENT(S) FOR INTRANET WEB
Safety Department Head	<ul style="list-style-type: none"> • List of safety instructions • Monthly Safety Officer surveys
Aviation Safety Officer	<ul style="list-style-type: none"> • Pre-Mishap Plan instruction • Aircraft Mishap Board training • ASC/OSH Meeting Monthly minutes
Ground Safety Officer	<ul style="list-style-type: none"> • Safety Indoc instruction • Quarterly safety stand down schedule of events • Safety Petty Officer Guide • Emergency Data sheet • ASC/OSH Meeting minutes by month
F-5 Model Manager	<ul style="list-style-type: none"> • F-5 Unclassified NATOPS
NATOPS Officer	<ul style="list-style-type: none"> • NATOPS quizzes • Pilot NATOPS qualification monthly tracker • FCF instruction • OPNAV 3710 instruction (CD-ROM)
ACT Officer	<ul style="list-style-type: none"> • Monthly ACT schedule • ACT training materials
ORM Officer	<ul style="list-style-type: none"> • Instructions • Policy statement
Survival Officer	<ul style="list-style-type: none"> • Equipment listing and order forms
NAVPUBS/IGS Officer	<ul style="list-style-type: none"> • List of pubs

Table 6. Safety Department requirements for Intranet Web

TRAINING	REQUIREMENT(S) FOR INTRANET WEB
Training Department Head	<ul style="list-style-type: none"> • List of Training instructions • Monthly Training Plan • RDP schedule
Standardization Officer	<ul style="list-style-type: none"> • Stan board (message format) • Stan meeting minutes
Pilot Training	<ul style="list-style-type: none"> • Pilot training qualification monthly tracker
IUT Officer	<ul style="list-style-type: none"> • Grade sheets • IUT tracker database • Syllabus changes recommendations
Ground Training Officer	<ul style="list-style-type: none"> • Drill period schedules • 3500 training tracking sheets

Table 7. Training Department requirements for Intranet Web

Command Career Counselor	<ul style="list-style-type: none"> • List of Divisional Career Counselors • List of programs and opportunities • Command retention statistics • Retention team activities report • List of CCC instructions • Reenlistment and retirement ceremonies
Drug/Alcohol Program Advisor	<ul style="list-style-type: none"> • List of DAPA instructions • Urinalysis Information • Items of interest
Command Financial Specialist	<ul style="list-style-type: none"> • Financial information • Helpful links
Command Managed Equal Opportunity Officer	<ul style="list-style-type: none"> • Command Assessment Team Report • Equal Opportunity Instructions • Command Training Team • CO policy letter
Ombudsman	<ul style="list-style-type: none"> • Monthly Newsletter • Birthdays and key dates • Spouse's club information
Senior Watch Officer	<ul style="list-style-type: none"> • Monthly Squadron Duty Officer Watchbill • Watchstander snivels • Policy statements • Watchstanding Training
Officer Mess Treasurer	<ul style="list-style-type: none"> • Monthly Officer Mess assets and dues report • Command Function specific information • Suggestion Box
Physical Readiness Test Coordinator	<ul style="list-style-type: none"> • Schedule of semi-annual PRT • PT program information • Fitness links and information
Moral, Welfare and Recreation Officer	<ul style="list-style-type: none"> • Recreation Committee meeting minutes • List of division Recreation Committee members • List of all squadron social events • Unit activity fund accounting report • List of all squadron sporting events and activities • Suggestion box
Urinalysis Program Coordinator	<ul style="list-style-type: none"> • List of changes in laws and procedures • List of Assistant Urinalysis Program Coordinators • Urinalysis program information
Sexual Harassment Prevention Coordinator	<ul style="list-style-type: none"> • Sexual Harassment Prevention instructions • Schedule of annual training • CO policy letter • Grievance process information

Table 8. Command Organization requirements for Intranet Web

3. GroupWare Requirements

Prior to the LAN connectivity, the command had been able to send email outside the command through modem connections and a hand full of command AOL accounts. The external emails contained attached documents in Word or Excel, such as the Wing monthly maintenance and operations reports, respectively. This system also enabled some routing of email within the squadron to those that utilized the AOL accounts, but the use of email within the squadron was not widespread. Once the LAN was in service, GroupWise accounts were obtained from the NAS Fallon AIS organization for every member in the squadron for use with the base GroupWise server.

Once everyone obtained their own account and the appropriate GroupWise software was loaded on each client machine, email became a viable alternative for routing attached files within the squadron as opposed to the traditional submission of paperwork and floppy disks. Since a routing system needed to be designed, it was critical to determine how paperwork was currently being routed. For example, how did the daily flight schedule get from origination at the Schedules Officer to a signed document to be posted in the Ready Room. An analysis of current routing procedures was performed in order to develop an electronic routing system that mirrored the current system.

In addition to providing the ability to send email, the GroupWise software had the capability to provide collaboration between squadron members. This collaboration could be performed through sending notices, assigning tasks, and scheduling meetings. Identifying procedures on how to best utilize the collaborative tools of the GroupWare was addressed.

Document Routed	Document Format	Routing Sequence
NAVFIT (FITREP)	NAVFIT	Admin-DH-OIC-XO-CO-Admin
NAVFIT (EVAL)	NAVFIT	Admin-DivO-DH-OIC-XO-CO-Admin
Pilot grade sheets	Excel	InstructorPilot-TrainingOfficer-IUT Manager
Instructions	Word	Originator-DeptHd-Admin-OIC-XO-CO-Admin-DeptHd
Notices/Reports	Word	Originator-Admin-OIC-XO-CO-Admin
Travel Voucher	Word	Traveler-Admin-Traveler
Flight Schedule	Excel	Skeds-Opso-CO-Skeds-SDO-Ops
Awards	Word	Originator-DivO-DeptHd-Admin-OIC-XO-CO-Admin
E-snivel	Word	RemoteUser-SkedsO-OpsO-RSTARS-Admin

Table 9. Squadron Document Routing Sequence

Individual's schedule	Schedule available to whom
Commanding Officer	All hands
Executive Officer	All hands
Officer-in-Charge	All hands
Command Senior Chief	All hands
Department Heads	All hands
Committee members	Others within committee
Members of Department	Department Head and others in department

Table 10. Individual's schedules

4. Remote Access

The ability to enable remote users, mostly the SELRES pilots, access to the Intranet Web site and utilize the GroupWise accounts was addressed as an important requirement.

5. Security

A necessary and important requirement was to ensure that the Intranet Web site was secure. The security functions inherent to Windows NT were addressed in

developing a system for granting folder permissions to specific groups or individuals. GroupWise security functions were also investigated.

VII. PROTOTYPE DEVELOPMENT

A. INTRODUCTION

The prototype process commenced shortly after the initial basic requirements analysis was completed. Initial prototyping began on my home computer so I could become familiar with FrontPage98. My home computer was running on Windows95 and the Personal Web Server. This arrangement was satisfactory for learning the basics, but it was necessary to develop an Intranet that ran on a LAN. I was able to secure a 400MHz computer with 256M RAM running Windows NT Server that was connected to the campus LAN in the Internet to Sea Lab at Naval Postgraduate School. This proved to be an ideal setup for the prototype development.

In early FEB99, a trip was made to the customer to install the first operational prototype. This involved installing FrontPage98 onto the server, upgrading the Web server software to IIS 4, and installing the Intranet Web software that had been developed to that point. The Operations Department, consisting of four computers, was chosen as the test bed for the initial prototype. During this period, GroupWise accounts and Internet access were set up so that users could send email and access the World Wide Web. There were some unique aspects to this evolution which are described in later sections of this chapter.

After the initial prototype was installed on the customer's server, the prototyping process continued at NPS for about a month. Then in early MAR99, a trip back to the customer was made to install the final operational prototype. Although the Intranet Web did not encompass every facet of the basic requirements analysis, it was nonetheless operational. A description of the final prototype is described in a section of this chapter.

B. WEB GENESIS

1. Getting Started

As previously stated, FrontPage98 was chosen as the Web development tool for this project. The process of building the Web began by opening FrontPage Explorer and choosing "New-FrontPage Web" under the "File" heading. At this point, a selection from

a choice of "Web Wizards" were presented. In this case, a selection of "Empty Web" was chosen. The "Web Wizard" prompts the user for inputs and within a short time, a basic web with associated required folders has been developed. Once the underlying structure has been organized, additions to the Web can be made.

2. Web Root

When a new Web is made in FrontPage98, a file named "default.htm" is automatically added. This file was identified as the Intranet Web homepage. Making this file the homepage worked out well because the Web Server (MIIS 4) default web site is programmed to launch the file named "default.htm" as the Web homepage. Having a file named anything else requires changes to be made in the Web Server. To avoid this, the file homepage file was named "default.htm".

When the MIIS 4 Web Server software is installed, it automatically creates a folder on the server named "inetpub". This folder is where all the Web server information is contained. Under that folder are four subdirectories named "ftproot", "gopheroot", " ", and most importantly "wwwroot". It is within the "inetpub/wwwroot" that all the Intranet Web files are contained. This path is known as the Web root. When using FrontPage, the Web root is the name of the computer. In this case, the customers server was named "saintserver", so the Web root was also "saintserver". Therefore, the directory "inetpub/wwwroot" viewed in Windows Explorer on the server is synonymous with "saintserver" viewed from within FrontPage98. The Web root of "saintserver" is what the Webmaster sees when authoring in FrontPage98, but it is not what the user types in when wanting to view the Web site.

To access the Web root from a client machine to view the Web, a user needs to type in the URL consisting of the IP address or Domain name of the site and homepage file name. In the case of the customers site, the IP address method was utilized as DNS was not implemented. The IP address of "saintserver" was "164.230.140.150". Therefore, to access the Intranet Web from a client machine using a browser, the user needed to type in "<http://164.230.140.150/default.htm>" to bring up the Intranet homepage. From this point, the user could navigate anywhere within the site.

3. File and Folder Organization

When creating a new Web site within FrontPage there are a few folders that are made by default. These folders, such as "images" and "borders" should be kept and left unaltered. Additional folders should be created to organize the volume of files that will be created to form the Intranet. Therefore, it is important to have a well structured system so that information can be stored efficiently. This is especially important because Intranet users will be adding content to specific folders and it is necessary to keep it manageable for all hands. In addition, keeping all files in a particular folder makes it easier for the Webmaster to assign user or group permissions.

Folders were named and organized based on the requirements analysis. In the default root directory, folders were made named "Executive", "Departments", "Organizations", "Collateral Duties" and "All Hands". Then within each of those folders were placed subfolders. For example, within the "Departments" folder were placed folders named "Operations", "Maintenance", "Training", "Safety" and "Administration". Then within each of these folders, more folders were created to give each division of the department a spot to save created files.

All files and folders were named using a standard naming convention. This was done to provide a standard appearance that enabled ease in locating and linking files. All the files and folders used a standard style of capital first letter with following letters small (ex: "Operations"). Files and folders with more than word had a mix of caps and small letters (ex: "AllHands"). When naming files and folders, a standard should be used, but it doesn't matter whether it appears as "FirstSecondWord.htm", "First_Second_Word.htm", or other.

C. WEB DESIGN CONSIDERATIONS

1. Simplicity

The initial Web pages were designed with the FrontPage default page properties consisting of white background, black colored font, and predetermined hyperlink status colors. Through various iterations, a final page design was established. It was a simple design consisting of simple borders and colors. Each page used a top and bottom border

from within the "_border" directory, a feature inherent to FrontPage98. Banners or marquees were not used to reduce the loading time of pages.

2. Consistency

Initially, it was planned that all squadron members would utilize Internet Explorer 4.0 as the browser for the Intranet Web. However, there were a few problems related to the Novell NetWare that precluded this scenario. The reason for and solution to this problem is described in the Internet section of this chapter. Instead of IE, a different browser called Neoplanet was utilized on all client computers. This enabled a consistent appearance without concern for browser compatibility. Since all members had 17" monitors and most had set the monitor to a resolution of 800x600, Web pages were developed for presentation given these preferences.

Web pages, tables and hyper-linked documents were designed to be standard in appearance. Each page had the same colored background, text font, and hyperlink color. Tables all had similar properties. For example, tables that included links to each of the twelve months were designed as shown in Figure 2.

3. Elegance

The colors utilized in designing the Web pages were based on the colors of the squadron patch. These colors were blue, yellow and red. The background was blue, the font color was yellow and there was a hint of red in the image used as a dividing line. The font type of Arial Rounded MT Bold was chosen due to its eye appeal.

The dividing lines used to separate the header and footer from the body was an integral part of the borders. The "_borders" directory initially contained four files: "top.htm", "bottom.htm", "left.htm" and "right.htm". The left and right borders were not used in this Web site.

As shown in Figure 2, the top border was created with the text "Saint Adversary Web" displayed across the top in yellow. Below this text was placed an image entitled "jetright.gif". The image was that of a jet aircraft with an exhaust section colored red and a "vapor" trail.

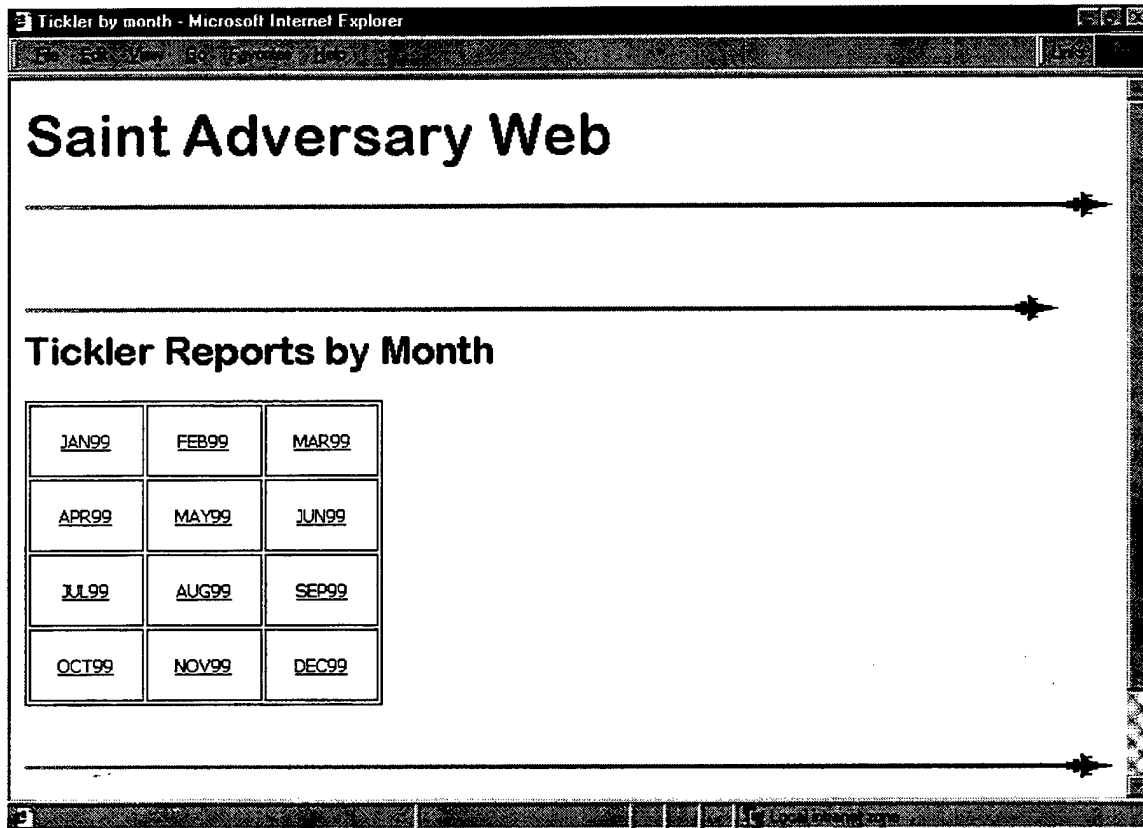


Figure 2. Sample Web Page

This image proved an excellent dividing line between the heading and navigation buttons as well as a visually appropriate icon for the squadron. Below the image dividing line were the navigation buttons. Then below the navigation buttons was another "jetright.gif" image. While the first image was set at 100% across the page, the second lower image was set at 95% across the page. This produced a result which made the two aircraft appear to be flying in formation.

The bottom border was created with the text "Last updated:" on the bottom in a white colored font. A FrontPage component was inserted to automatically insert the date that the page was last updated. Beneath that text, the email address of the Webmaster was provided to send comments. Above the text was another image of "jetright.gif".

4. Usability

Initially, the Web site was designed using framed pages. However, this type of navigation scheme proved unsuitable for the customer's needs. Therefore, all Web pages were created in an unframed environment.

To enable users to easily navigate within the Web, the "buttons" of the FrontPage component in the "top.htm" file were set to "Child", as well as always including "Home" and "Parent". This enabled users to quickly return to previously visited sites without having extensively use the browser "Back" function. For this system to function, "child" files had to be attached to their "parent" files by dragging and dropping the files while within the FrontPage Explorer Navigation view. As shown in Figure 3, the file for the Operations Officer homepage, named OPSO, is attached to the Operations Department file. Through connecting all the files as desired in the FrontPage Explorer Navigation view, hyperlinks are automatically assigned and users are able to navigate easily.

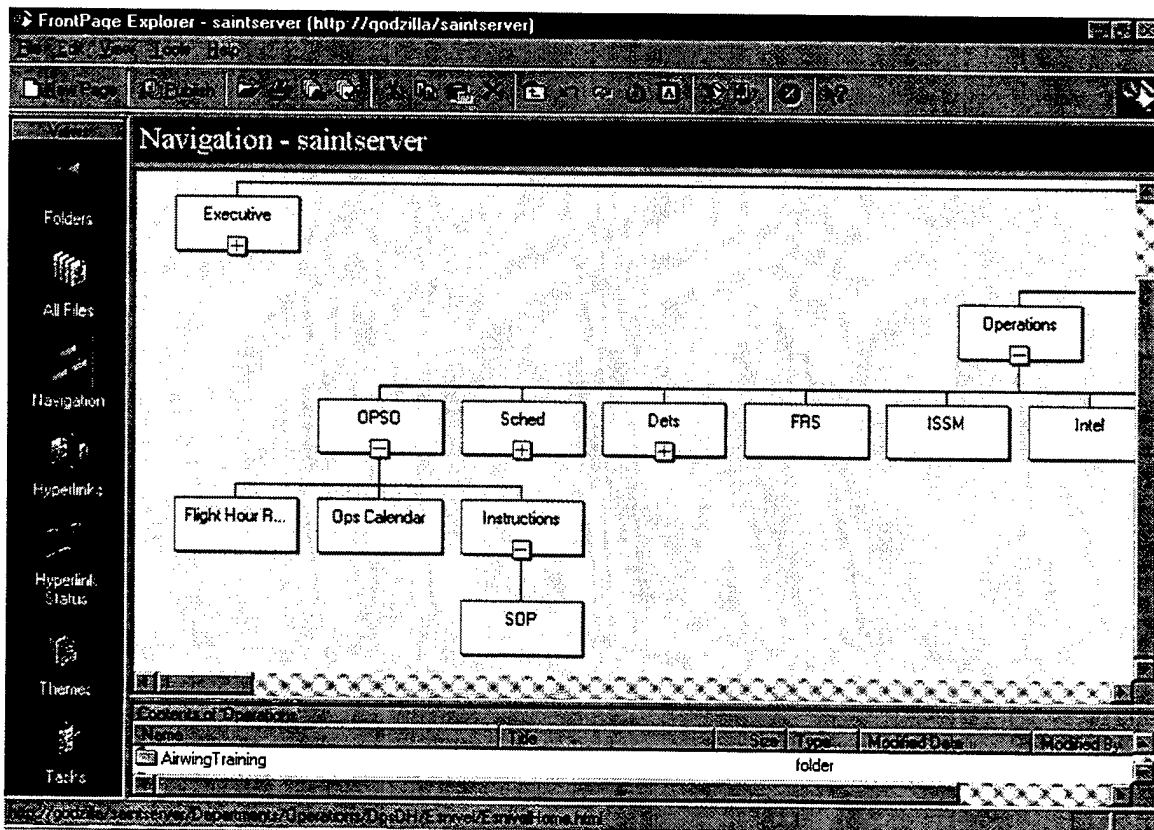


Figure 3. Sample Navigation View

D. CONTENT

Once the basic files and folders were organized and the navigation structure was in place, the Web site was populated with content. The simple Intranet was initially populated with static pages.

1. Published Documents

The main objective in building the simple Intranet was publishing HTML documents to the Web. This was basically a two step process. First, documents in Microsoft Word97 and Excel97 were converted into HTML. The second step involved publishing the new HTML document to the Web.

a. Converting existing documents to HTML

All Office97 files can be converted into HTML files as described in a previous chapter. In the case of publishing documents, Word and Excel will be described here. Converting Access and PowerPoint are discussed in later sections.

Saving Word and Excel documents to HTML is very simple. Under the save as options, selecting "Save as HTML" performs this function. The conversion process is however not exactly seamless. There are differences in the tabbing configurations between both Word and Excel, and the HTML documents. For this reason, once the file has been converted from either Word or Excel, some reformatting while within the HTML mode is necessary. There are numerous features that can be used to format the HTML document within Word, including a valuable one called hyper-linking. This feature allows hyper-linking within the document to easily find desired information.

After the converted document has been reformatted, the new ".htm" document will have to be saved to a folder in the Web server. To accomplish this, the new HTML file will first have to be imported to the Web through FrontPage. First, the file needs to be saved to a temporary folder ("...WebTempHTML") until it can be imported. Then, as will be explained in the next section, the file will then be imported into the Web. For example, the squadron standard operation procedures (SOP) document was currently saved as a Word97 document. The document was then saved as (SOP.htm) and reformatted to account for tabbing differences which included inserting tables in certain cases. Within the table of contents, hyperlinks were added to appropriate sections

of the document. The file was then saved in a folder named "SaintWebTempHTML" awaiting import to Web server via FrontPage.

b. Publishing HTML documents on the Web

Once the document was in HTML format, it could be posted onto the Web site. For example, in line with the basic requirements analysis was the desire to have the SOP published online under the Operations Officers homepage ("OPSO.htm").

The first step in this process was to create a Web page that would connect to all the Operations instructions aptly named "Instructions.htm". This Web page named "Instructions.htm" was created and connected as a "child" to the parent file "OPSO.htm" under FrontPage Explore Navigation view. This created the connection for the navigation button to all Operations instructions.

The next step was to import the newly created "SOP.htm" document. This step was accomplished in FrontPage Explorer by dragging and dropping the "SOP.htm" file from the "...WebTempHTML" folder into the desired FrontPage folder, in this case the "Instructions" folder within the "OPSO" directory.

Once imported into the desired directory, the file had to be linked to the "Instructions" Web page. To accomplish this step, the Web page named "SOP.htm" was connected as a "child" to the parent file "Instructions.htm" under FrontPage Explore Navigation view.

The squadron had most of its documents, instructions, notes and memos saved as Word97 files. A few of these Word97 documents were saved as HTML and posted on the Web to demonstrate this capability. Among those documents published on the Web were the Retention Instruction, Detachment Checklist, Safety Survey, Functional Check Flight Instruction, and Standard Operating Procedure (SOP) Instruction. Some of the documents, such as the SOP shown in Figure 4, contained internal hyper-links that demonstrated the ease of navigation. The squadron had a few spreadsheets that were saved as Excel97 files.

A few of these Excel97 spreadsheets were saved as HTML and posted on the Web to demonstrate this capability. Among those spreadsheets published on the Web were the Daily Flight Schedule shown in Figure 5, Administration Monthly Tickler Report, the Operations Pilot Qualification Tracker and Key West Tracker.

SOP - Microsoft Internet Explorer - [Working Offline]

Table of Contents

- I. Qualifications for Flight
 - 1. General
 - 2. Prior To Flight
 - 3. Currency Requirements
- II. Flight Procedures
 - 1. General
 - 2. Briefing
 - 3. Ground Procedures
 - 4. Takeoff/Rendezvous procedures
 - 5. In-flight
 - 6. Air Combat Maneuvering (ACM)
 - 7. Low Altitude Training

Figure 4. SOP Table of Contents

FIGHTER SQUADRON COMPOSITE THIRTEEN - Microsoft Internet Explorer

FIGHTER SQUADRON COMPOSITE THIRTEEN

Saint Adversary

NAS FALLON, NEVADA

HANGAR #4

SAINT ONE		SAINT TWO	
CDR M. Q. WHITTLE		CDR C. J. CHAMBERLAIN	

CALL SIGN: SAINT	SUNRISE: 0759	MOONRISE: 0910	DATE: 1/25/99
TAIL LETTERS: AF	SUNSET: 1701	MOONSET: 2031	DAY: Tuesday
AIRCRAFT TYPE: F-5E/F TIGER II		ILLUM: 14%	JULIAN: 99025
SDO: LT JONES	(0700-1400)	MMT SUPERVISOR: ATCS WILLIAMS	
SDO: LT PERCIVAL	(1600-0700)	MMT DUTY BEEPER: 1-800-918-7310	
ODO: LT AUGENSTEIN	(1400-1600)	SQUADRON DUTY PHONE: 3645/3646	
		READY ROOM: 3644	
LECTURES/MEETINGS			
TAD / LEAVE			

Figure 5. Daily Flight Schedule

2. Creating a News page

To enable quick dissemination of information to the squadron, a news page was created. The FrontPage "Web Wizard" function of Discussion Group was utilized to quickly and easily make the news page. From within FrontPage Explorer, the drop down menu selection of "File-New-Web page" was selected. From the wizard, "Discussion group" was selected and a check mark was placed in "add to current web". Then the wizard prompted questions as to how the form would be named and functions to include. In this case, the title of the discussion group was "Saint Daily News" and the functions of "Table of Contents" and "Post" were selected ("Search" and "Reply" were not deemed important for this topic). The wizard produced all the files and folders required. Once the file named "SaintDailyNews_TOC" was created, it was added a "child" to a parent file named "AllHands.htm" which was the All Hands homepage. The News Page Table of Contents, shown in Figure 6, contains the subject line of each news article. To find out more information about the article, a user simply clicks on the hyper-linked subject line to link to the complete article. To post an article, a user clicks on the "Post" hyper-link and a submission form appears as shown in Figure 7.

3. Master Template folder

A folder named "MasterFolder" was created and put in the Web root. This folder contained templates of standard pages, tables or calendars. The purpose of creating this template folder was to provide ready-made files that could quickly be incorporated when the need arose. For example, a copy of "StandardPage.htm" was developed which had the standard background colors, hyperlink color scheme, shared borders, etc. as all the other pages in the Web. Another file named "MonthlyCalendar.htm" was developed which had the standard background colors and table properties as all the other monthly calendars in the Web. A ready made submission form and confirmation page were also developed. Having these ready-made templates eliminated the requirement for building new files from scratch.

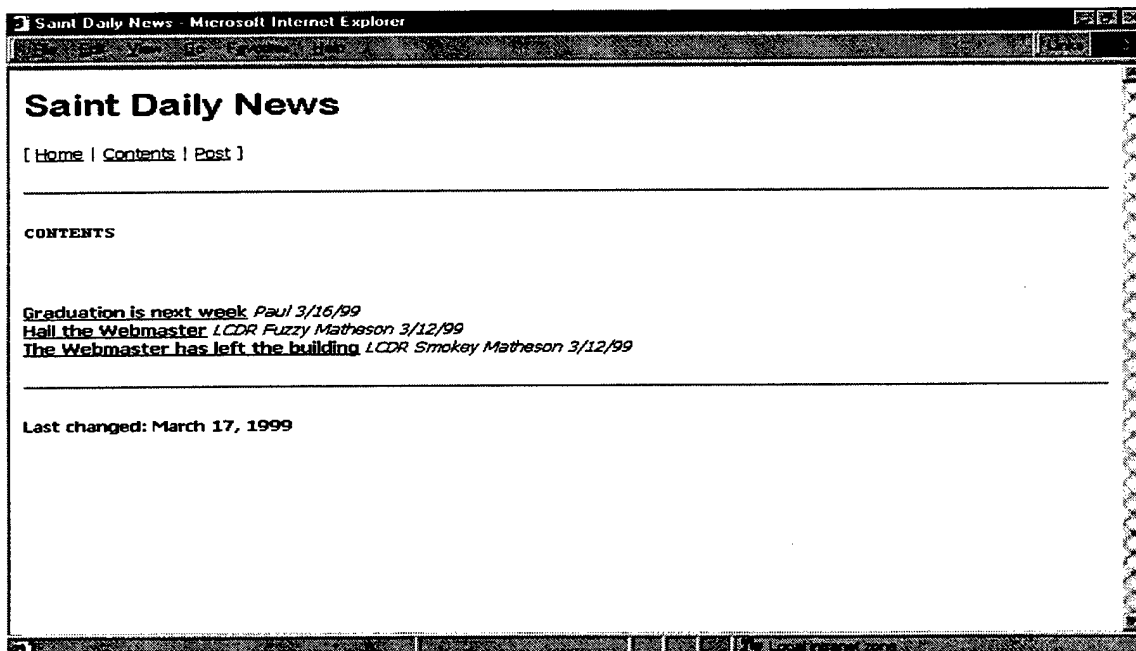


Figure 6. News Page Table of Contents

The screenshot shows a web browser window titled "Saint Daily News Submission Form - Microsoft Internet Explorer". The page has a header with the title "Saint Daily News" and navigation links "[Home | Contents | Post]". Below the header is a section titled "POST ARTICLE". Underneath, it says "[FrontPage Discussion Component]". The form includes three input fields: "Subject:" with a text box, "From:" with a text box, and "Comments:" with a large text area. At the bottom of the form are two buttons: "Post Article" and "Reset Form". The browser's status bar at the bottom shows the address "http://localhost:8080/".

Figure 7. News Page Post Article

4. Help for Intranet Contributors

A help page, shown in Figure 8, acquired from the FrontPage CD-ROM was added to the All Hands Homepage to assist those new to the concept of an Intranet.

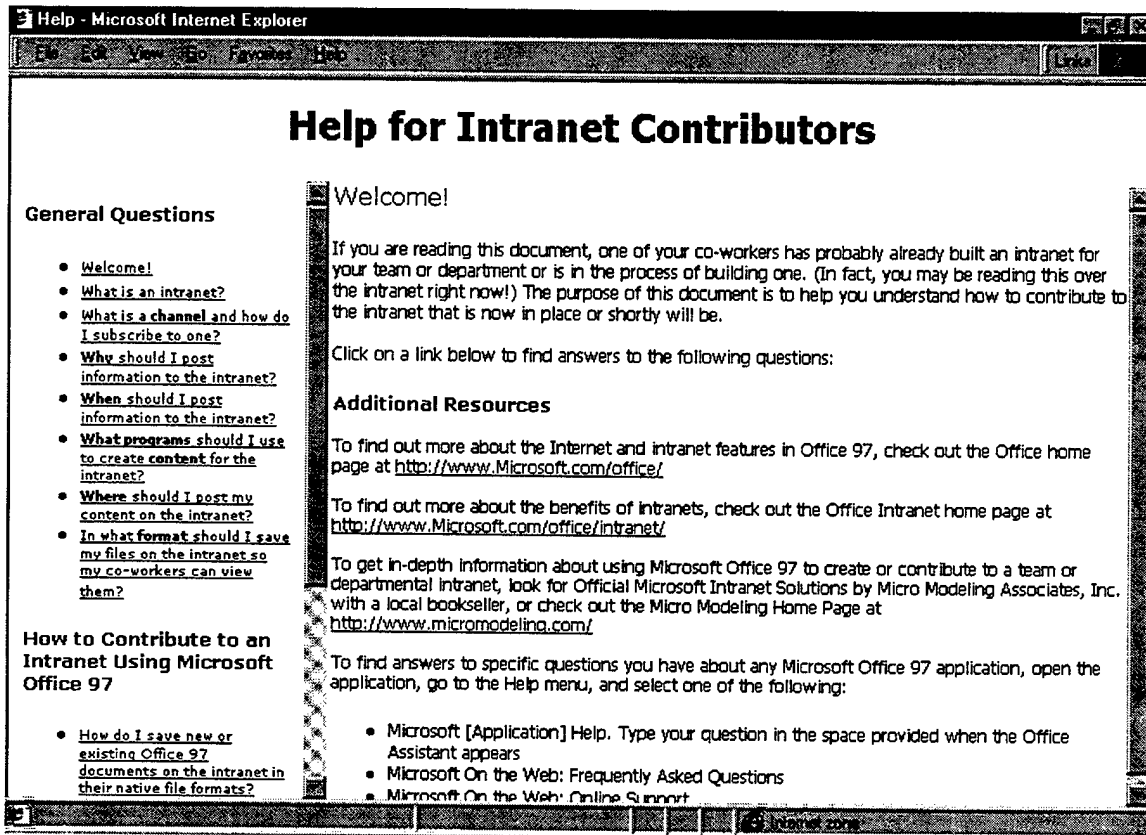


Figure 8. Help for Intranet Contributors

E. SCALING UP

Once the process of publishing static Web pages and producing forms through the use of the FrontPage wizard was diagnosed, the challenge of incorporating dynamic Web pages commenced. This was definitely the "fun" part of the entire thesis.

In this section, the integration between Microsoft Office97 and FrontPage98 combined with the inherent functionality of MIIS to create dynamic, Web-based database solutions is described. It is important to point out from the onset that throughout this process of creating dynamic Web pages that none of the steps involved Visual Basic or JAVA scripting and that none of the underlying HTML code was revised. All the

dynamic pages were created from either wizards in Access 97 or FrontPage 98. Also, the incorporation of PowerPoint presentations saved as HTML is addressed.

Although the Intranet was operational and had some functionality, it was not quite ready for everyday use. There were still some milestones to achieve to enable the customer to have a useful operational Web. The requirements to attain a working system are listed in the final chapter. Although the Intranet was not quite ready for prime time, the majority of the underlying structure had been put in place. All that was required at the completion of the thesis project was for the squadron to add content to the structure.

During the thesis process, some content was added. The content that was added was done in a manner as to demonstrate different capabilities. Examples of those capabilities can be found in the sections that follow.

1. Posting Information from Access97

The ability to post dynamic information from an Access97 database to the Web is a powerful tool. In this way, at the same time that information is being entered into a specific database, it will be available to viewers on the Web. A complete step-by-step list of instructions on how to perform this procedure can be found in Appendix N – Create Dynamic Web Pages Using Access97.

In Microsoft Access 97, users can share static views of their data on the Web by clicking the Save As HTML command. Microsoft Access outputs table, query, and form datasheets as well as formatted reports directly to HTML. There are two ways to save information dynamically from within Access97. These two methods of saving a database dynamically are IDC/HTX and ASP. Although only the IDC/HTX method was utilized in this Web, background on both is provided here.

Leveraging the Internet Database Connector (IDC) functionality that is native to Microsoft Internet Information Server, Microsoft Access 97 provides an easy way for users to share their structured data in a workgroup or over the Internet. Users select the objects they want to publish and provide a few basic pieces of information, and Microsoft Access 97 does the rest. Microsoft Access creates the query files (ICD files) containing information about the view of data to publish, and the templates (HTX files) that contain information about how to format the information that is returned. (Access)

ActiveX Server, a component of Microsoft Internet Information Server 3.0 or later, uses ActiveX Server page (ASP) files to get data from an ODBC data source and

format it as an HTML Web page. The ASP file contains server-side scripts that specify how to connect to the data source, as well as the appropriate HTML tags to format the data once it's returned. For a form saved as an ASP file, the ASP file also contains ActiveX controls and VBScript code. (Access)

The squadron had very few databases that were saved in Access97. There was however a movement within the squadron to start developing more databases. The Operations Department had developed a Flight Hour Tracker database and the Training Department had developed an Instructor Under Training Tracker (IUT) database. A database developed by CDR Bruce Patrou as part of his thesis was provided to the Administration Department. A few queries from these databases were saved as HTML and posted on the Web to demonstrate this capability. Among those published on the Web were Night Time and Last Hop from the Flight Hour Tracker database, FAM Syllabus from the IUT database, and Recall from the Administration database.

2. Creating FrontPage Forms

In this process, forms were created using FrontPage98 and then connected to an Access97 database. The database was then connected to the Web as described in the previous section. Using the FrontPage Editor, making forms was a simple process. Connecting them to an Access database was also a rather painless evolution. This procedure is described in depth in a step-by-step guide found in Appendix O – Create Dynamic Web Pages With FrontPage Forms.

There were various forms created using FrontPage98 that were fully operational. An Anymouse form was made for the Safety Department, a CO Suggestion Box form was made for the Commanding Officer, an Esnivel form was made for the Schedules Officer, and a NATOPS sample quiz shown in Figure 12 was made for the NATOPS Officer. Also, for the Schedules Officer, a pilot snivel submission form, confirmation form and query result page were created and are shown in Figures 9, 10, and 11, respectively. All these forms dynamically linked the input form to an Access database which in turn dynamically linked to an HTML output or to an Access report.

3. Creating PowerPoint Web Presentations

Creating HTML slides from PowerPoint was a simple process through use of the wizard function. There were three options to choose from for graphic type: (1) GIF, (2)

JPEG, and (3) PowerPoint Animation. Through the PowerPoint Animation feature, slide shows could incorporate multimedia capabilities of audio and video. To view PowerPoint Animation presentation required the viewer to have PowerPoint Animation Viewer installed. This software viewer was downloaded for free from Microsoft's Web site.

The squadron had various presentations that were saved as PowerPoint97 files. Most of these were for pilot training purposes. However, none of these were published to the Web. However, two example PowerPoint presentations were posted on the Web to demonstrate the capability. The first example was a simulated Course Rules presentation saved as a GIF graphic shown in Figure 13. The second example involved various multimedia objects, such as *.mov, *.mpg, *.qt, and *.wav, that were saved in a PowerPoint presentation using the Animation feature.

The image is a screenshot of a Microsoft Internet Explorer window. The title bar reads "Snivel Form - Microsoft Internet Explorer". The main content area has a large heading "Saint Adversary Web" at the top. Below the heading are two horizontal lines with arrows pointing to the right. Underneath these lines is the section "Pilot Snivel Log Input Form". This section contains several input fields: "Last Name" with a text box, "Rank" with a dropdown menu showing "Choose", "Day of week" with a dropdown menu showing "Choose", "Date: Month" with a dropdown menu showing "Choose", and "Day" with a dropdown menu showing "Choose". Below these is a "Snivel" label followed by a long text box. At the bottom of the form are two buttons labeled "Submit" and "Cancel". The browser's status bar at the bottom shows the address "http://www.saintadversary.com/".

Figure 9. Pilot Snivel Input Form

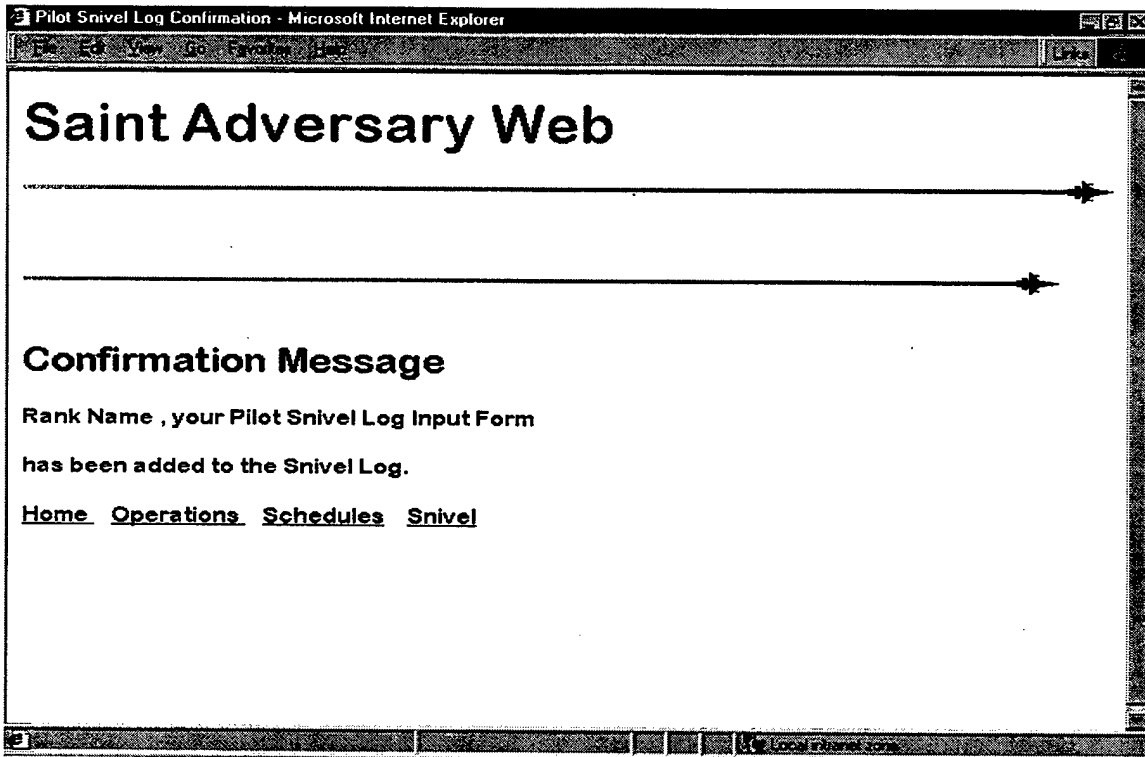


Figure 10. Pilot Snivel Confirmation

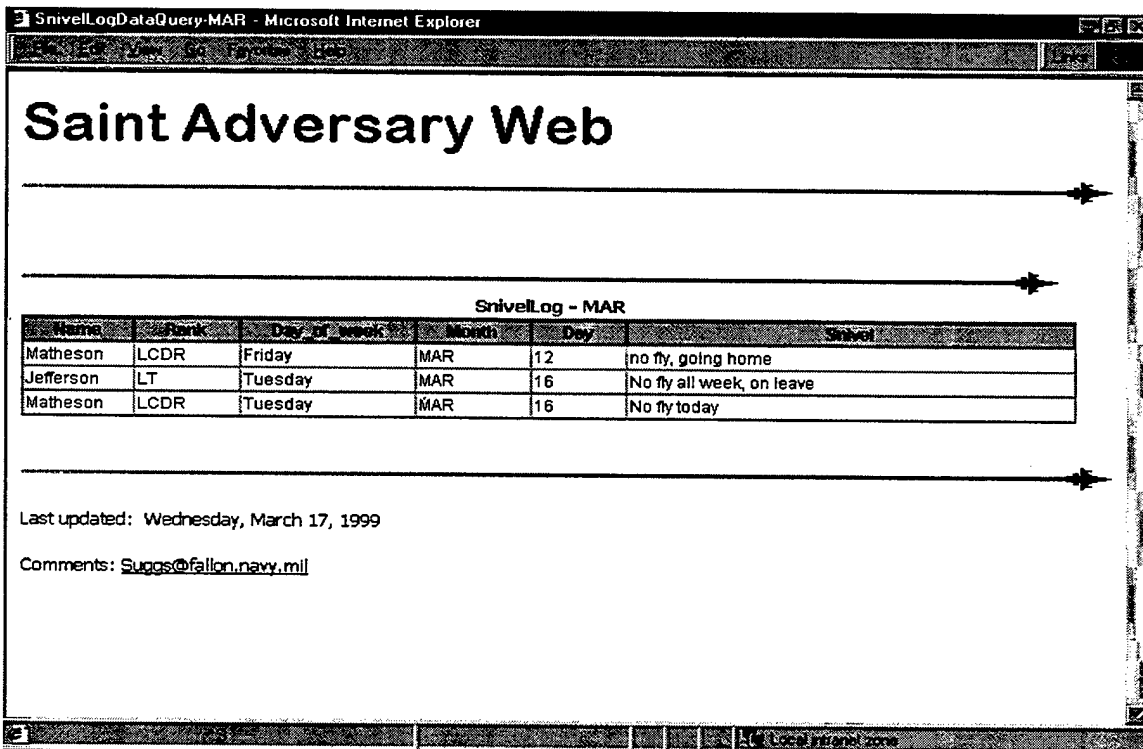


Figure 11. Pilot Snivel Query Results

Quiz #1 - Microsoft Internet Explorer

Saint Adversary Web

NATOPS Quiz

Last Name Rank Date: Month Day

1. What is max no flap landing speed?

A. 120
B. 150
C. 180
D. None of the above

2. What is first step in bailout procedure?

A. Make a call
B. Set wings level

Figure 12. NATOPS Quiz

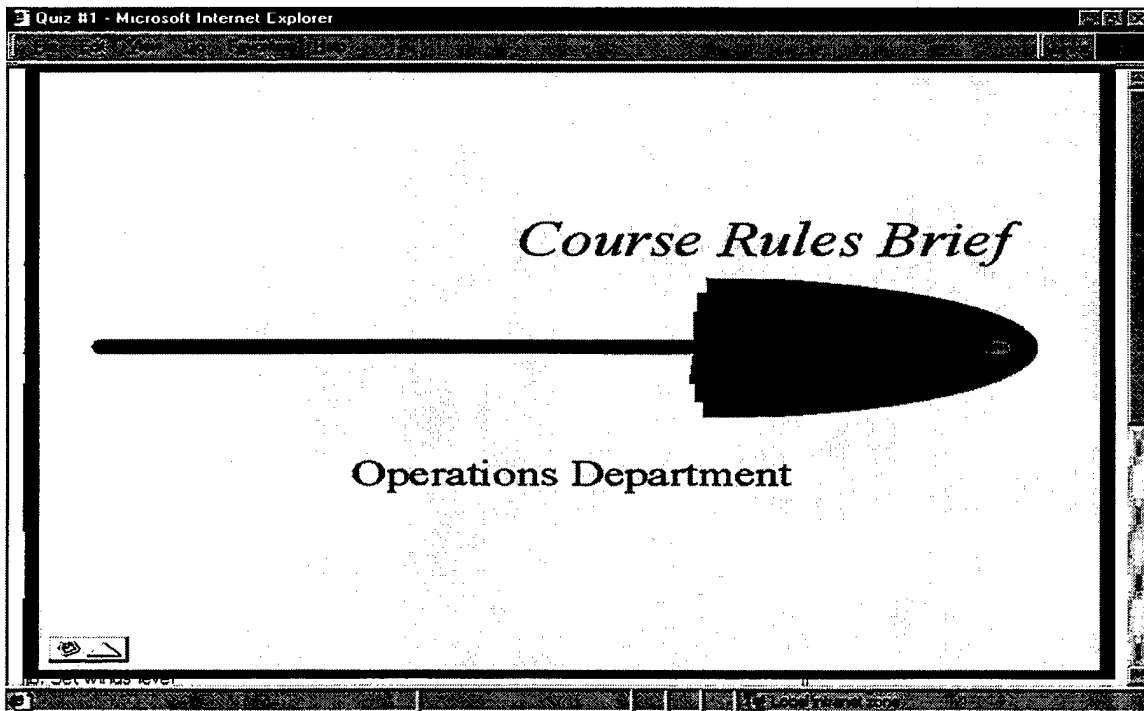


Figure 13. Course Rules PowerPoint Presentation

F. REMOTE ACCESS

The remote access service (RAS) server was set up and operational. The RAS server was a computer in the Operations Department office. One of the existing phone lines in the office was utilized for the modem connection to the RAS server. The phone connection to the RAS server was tested from within the office and from a computer in Monterey. From the RAS server, access to the entire Intranet Web was possible, albeit at a much slower access speed than previously enjoyed at the LAN connection rate. Access to the RAS server was only allowed through the Administrator account. Once the remote user connected to the LAN via the RAS server, access to the Web site was done in the same manner as through client machines by simply typing in the URL in the browser.

G. GROUPWISE

All client computers came equipped with a modem. Prior to acquiring GroupWise accounts, some squadron members utilized either their personal accounts or a few squadron AOL accounts to send email. Once the customer's LAN was operational, the NAS Fallon AIS office provided each squadron client computer Novell GroupWise 4.1A for Windows software and issued each squadron member a user account.

For the GroupWise to run in harmony with the Windows NT Workstation operating system, each computer was provided an additional program called Novell IntranetWare Client for Windows NT. This combination of Novell software enabled clients to connect to the Novell Server on the NAS Fallon LAN to send and receive email via the customer LAN. This arrangement negated the necessity for clients to utilize their private accounts or the squadron AOL accounts over a modem connection to send and receive email. However, the squadron decided to keep their AOL accounts as a backup to the GroupWise accounts. NAS Fallon was in the process of standing up a Microsoft Exchange server and the implications to that arrangement are described in the final chapter.

At the time of implementing the Web, there was not a lot of focus on fully developing GroupWise functionality. Squadron members were actively using email, but the collaborative tools were left primarily undiscovered by the vast majority of users. Through the basic requirements analysis, the notion of developing specific routing slips and availing personnel schedules was addressed. Due to time constraints of this project and the learning curve of those using the new software, there was virtually no inroads into

this part of the Intranet development. However, together with the Operations Officer, many of the functionalities of the collaborative tools were investigated and tested. Future implementation issues are described in the next chapter.

H. INTERNET ACCESS

As stated, all client computers came equipped with a modem. Prior to the customer's LAN becoming operational, some squadron members utilized either their personal accounts or a few squadron AOL accounts to access the Internet.

Each computer came from Gateway 2000 with the Web Browser Microsoft Internet Explorer (IE) 3.02 installed. Once the LAN became operational, each client machine was upgraded to the latest Web browser version of the time (IE 4.0). As was the case with the Novell GroupWise working properly with Windows NT Workstation software, the IE 4.0 software required a Winsock file called "w32.dll" to be loaded into the folder that contained the IE 4.0 executable file. This step was necessary for connectivity to the NAS Fallon IPX Gateway which provided Internet access.

This additional Winsock file did affect client access to the Intranet. When IE 4.0 was launched, it would connect directly to the IPX gateway. It would not run on TCP/IP to access the Intranet Web URL on the server. As a work around, another Web browser would have to be used. At first, another copy of IE was saved on the client computer in a different folder than the original copy. In addition, the Winsock file was not added to the new folder. This method did not work as the IE reverted to its original configuration, that of running on IPX.

The solution to this problem was solved in a chance evolution of Net surfing. While contemplating using Netscape as the browser for the Intranet, the Operations Officer, formally the Information Officer, came across a free download browser named Neoplanet. This browser was loaded on a client machine and was able to connect to the Intranet Web URL.

Therefore, the final configuration for Internet access and Intranet access is not seamless. IE 4.0 is used for Internet access and Neoplanet is used to browse the Intranet. For ease of accessing the Intranet, a shortcut to Neoplanet has been placed on the client machine desktop and the default setting when the browser opens has been set to the Intranet Web URL homepage.

For most other situations, utilizing a single browser will allow for access to the Internet and Intranet. In addition, if Exchange, Outlook or Outlook Express is utilized as the email product, then launching IE will provide a seamless one stop point for access to the Internet, Intranet and GroupWare or email.

J. SECURITY

1. LAN

The server had been set up as the Primary Domain Controller. Therefore, all client machines were added to the domain, in this case "SAINT". The server was called "saintserver" and all other domain computers were given appropriate names. For example, the computers in Operations were named "Remote", "OPS-2", "OPS-3" and "OPS-4". Therefore, only those computers within the domain were authorized be in the LAN.

Once all the computers were added to the domain, user accounts were added through Windows NT Administrative Tools. Each member of the squadron was given a name and password. The naming convention used was that of last name. Individuals devised their own passwords based on the advice of the LAN Administrator. After individual accounts were set up, local and global accounts were set up. For example, the Administration, Operations, Safety, Training, and Maintenance Departments were made as groups and the individuals within the departments were added to the groups.

There were two methods of sharing folders on the LAN. The first involved sharing folders on client computers. The second involved creating shared folders on the server. In both cases, appropriate security permissions were assigned to each folder.

The server tape backup plan consisted of using seven 24M tapes to make incremental daily backups and one full weekly backup. This method supplemented the inherent property of disk mirroring offered by RAID Level 1.

The RAS server was set so that only the Adminnstrator could log on. Allowing other users, such as remote pilots, to access the RAS server is described in the next chapter.

2. GroupWise

The GroupWise email accounts had the same name and passwords as the Windows NT login. Therefore, once a member logged onto a client machine, they wouldn't have to login again when they wanted to access their GroupWise accounts. This reduced the confusion factor, while still enabling security.

3. Intranet

The Web root security permissions were set to Administrator (full control) and Domain users (read). As users start to add content to the Web, folder permissions will have to be adjusted to include full control for the authors.

The Web server permissions were set to Administrator only.

4. Anti-virus Software

Norton Anti-virus software was installed onto the server and all client machines. The software was downloaded from the DISA Web site in accordance with current policy as stated from the Web article on DOD-Wide Anti-Virus Software Licenses found in Appendix P.

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VIII. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

The two major research objectives were met in varying degrees. The first objective was to provide a quality product to the customer. An Intranet Web site was designed and implemented. GroupWare was installed and functional. Internet access was obtained. The basic tools were put in place for the customer to improve information access and dissemination, enhance communication, improve group collaboration, and enhance productivity.

In the span of about one year, the customer had gone from the initial idea of procuring necessary hardware and software for local area network development to providing each client machine access to GroupWare, the Internet and the Intranet Web. This type of sweeping change provided them a tremendous opportunity to reap the benefits of powerful technological business solutions. With continued forward thinking senior leadership and squadron member acceptance of the technology, the squadron will quickly learn the value of the system that has been put in place.

The secondary objective was to document the design, implementation and maintenance processes so that members of a typical Naval Aviation squadron could utilize the information as a guide in their own Intranet programs. This thesis provides that information through descriptions of various topics including LAN's, GroupWare and Intranet Webs.

Naval Aviation squadrons can put Intranet technologies to work for them at a relatively low cost using familiar software tools. By starting out building a simple system, a more sophisticated Intranet can be built from that foundation. In this thesis, the customer was using Microsoft Windows NT 4.0 and Office97 products. In addition, Microsoft products were chosen for Web development and the Web Server. Novell GroupWise was chosen as the customers GroupWare, however it was planned that Microsoft Exchange would replace that product sometime in the future. Although this thesis mainly described the Microsoft family of products as they related to the Intranet, it is important to re-emphasize that they are not the only products available. Web administrators should research alternative vendor products for Intranet development and maintenance.

2. RECOMMENDATIONS FOR VFC-13

The squadron has made great progress in its quest of implementing high tech business solutions. There is still more work to be done and challenges ahead. In this section, a few recommendations are provided to assist in continued Intranet development.

1. Training Plan

Training members of the squadron to properly and efficiently use GroupWare and add content to the Intranet Web is the critical ingredient to the success of the Intranet. This will be a big project that will take ongoing dedicated effort.

a. GroupWise

All members should to be taught the basic functionalities of GroupWise, which include topics such as calendar sharing, routing slip creation, and notification. The remote capabilities of GroupWise should also be addressed as a large number of reserve pilots could successfully utilize this tool.

b. Access

Members that are charged with tracking and monitoring programs should to be taught how use Access97 to build a database. The squadron should review what information is currently kept in Word or Excel that would better be kept in an Access database and then convert or import that data to such.

An outstanding ready-made database for the Administration Department was provided (Patrou). The Administration Department should become familiar with that database and populate it with accurate data.

Once databases are built, they should be dynamically linked to the Web for all hands viewing.

c. Word, Excel, and PowerPoint

All members should become familiar with the HTML functionality of Word, Excel, and PowerPoint. In addition, the squadron should determine which Excel documents could be more appropriately saved in Word format. All members should be taught how to save the HTML documents to the Web root. The Webmaster should

coordinate the background linking for the documents to allow users to add and update content.

For example, the Administration Department should organize all squadron instructions and notices. Once organized, the documents should be saved as HTML documents. Each document should be formatted to account for tabbing differences. Hyperlinks should be created within each document to allow viewers easy navigation. When saving documents as HTML, underlined words within the document should be changed to bold font instead to avoid confusion with hyperlinks. Once saved as HTML, the documents should be saved in the appropriate folder on the Web root and published on the Web.

d. Web Software

The Webmaster (and alternate) should become familiar with Windows NT 4.0, MHS 4, and FrontPage98.

2. To Do List

a. Operational Intranet Start Date

The Webmaster should devise a milestone plan for getting squadron members trained on Intranet functionalities and set a date when the Intranet will become operational. Once operational, all information posted on the Web should be kept current.

b. Policy Statement

The squadron should develop a policy statement that identifies such items as Webmaster responsibilities, user responsibilities, Intranet content, Internet software downloading, anti-virus program, etc.

c. CD-ROM stack

The squadron should investigate the requirement for adding a CD-ROM stack to enable clients to access additional reference material. With the vast amount of information available through Navy Web sites both on base NAS Fallon and elsewhere, this option is not immediately important. However, if it were found that items, such as

the F5 NATOPS manual, are available on CD, it would be well worth the investment to have that type of resource on line.

d. RAS server

At the time of Intranet development, the squadron only had one modem connection to the RAS server. The squadron should investigate the need for additional modem connections to allow multiple remote users to access the Intranet simultaneously. In addition, the addition of a 1-800 number or DSN connection should be investigated.

e. Security

The Webmaster should stay current on security topics. This can in part be done by visiting the DISA and DON CIO Web sites often to obtain updated information. In addition, the Webmaster, ISSM Officer, and Security Officer should devise a security plan based on the new technological capabilities.

3. Future Capabilities

a. Defense Message System

The squadron should investigate posting navy messages on the Intranet Web or through the LAN.

b. Security Software

The squadron should investigate security software such as Pretty Good Privacy (PGP) and other Public Key (PKI) products to enable more secure communications.

c. Virtual Private Network

The squadron should investigate the process of setting up a Virtual Private Network. This is a secure system of using Point-to-Point Tunneling Protocol (PPTP) to access the Intranet through the Internet. This option will become viable once the IPX gateway is replaced by an IP gateway.

APPENDIX A. ABBREVIATED SYSTEM DECISION PAPER

From: Commanding Officer, Fighter Squadron Composite THIRTEEN
To: Director, Naval Reserve Information Systems Office
Via: (1) Commander, Naval Air Reserve Force (Code N33, N6)
(2) Commander, Naval Reserve Force (Code N6)

Subj: ABBREVIATED SYSTEM DECISION PAPER (ASDP) FOR FISCAL YEAR
(FY) 1998 FEDERAL INFORMATION PROCESSING (FIP) RESOURCES

Ref: (a) COMNAVRESFORINST 5236.1E
(b) COMNAVRESFOR COTS Preferred Software & Hardware Guidance of Sept 97
(c) CINCPACFLT MSG DTG 300944ZMAR97 Information Technology for the 21st Century

Encl: (1) VFC-13 Abbreviated System Decision Paper (ASDP) Executive Summary
(2) FY-99 Abbreviated System Decision Paper (ASDP) for VFC-13
(3) VFC-13 Controlled Equipment Inventory System (CEIS) Listing

1. Per reference (a), enclosure (1) is submitted for you review and funding decision. The request for FIP resources is per reference (b).
2. The current FIP resource status of VFC-13 is unsatisfactory. The hardware and software requests summarized in enclosure (1), and detailed in enclosure (2), are needed to ensure this command can comply with IT 21 standards delineated in reference (c), overcome the Y2K challenge and meet our primary missions of Fleet Adversary Support and Mobility. Additionally, given the unique opportunity to leverage off existing NAS Fallon resources, this purchase will effectively provide VFC-13 with a fully functional LAN at a fraction of normal deployment costs.
3. VFC-13 POC is LCDR Jim Matheson, ISSM, DSN 890-3890, Commercial (702) 426-3890. E-mail: Matheson@Phonewave.net.

M. Q. WHITTLE

Encl: (1) VFC-13 Abbreviated System Decision Paper (ASDP) Executive Summary

1. Command Goals: Fighter Squadron Composite THIRTEEN's objective is to create a complete IT 21 compliant information systems network to meet foreseeable requirements into the 21st century.
2. VFC-13's current systems are as follows according to the CEIS:
 - a. Non-Pentium desktop PCs: 26
 - b. Pentium Desktops: 6
 - c. Functional Non-Pentium Laptops: 1
 - d. Pentium Laptops: 3
3. The Non-Pentium systems currently available will not support the WinNT operating system, are not fully Year 2000 compliant, and have reached the end of their life cycle.
4. Two of the existing Pentium desktops and two of the existing Pentium laptops can meet all IT 21 requirements with only minor upgrades. However, it is not cost-effective to upgrade the remaining Pentium computers to IT 21 standards.
5. The specifications for the preferred replacement computer is:
 - a. Pentium II 400MHz - 100MHz bus combined with this processor will ensure long-term system functionality
 - b. 64MB SDRAM - mandated by IT 21 and the WinNT 4.0 OS
 - c. 8.4GB or greater hard drive - smallest commonly available IDE drive from reputable manufacturers
 - d. 3½ inch floppy drive - standard
 - e. SCM PNP Swapbox PCMCIA - mandated by IT 21
 - f. 17" Trinitron monitor - mandated by IT 21
 - g. MS keyboard - standard
 - h. MS mouse - standard
 - i. 32X variable speed CD-ROM - allows no-wait access to CD-based instructions, catalogs, and other products
 - j. 3COM 3C905 10/100 PCI - required for LAN connectivity with NAS Fallon now, and into the future
 - k. Lexmark 7000 printer - High-quality single-user office printer with color capability
 - m. WinNT 4.0 - mandated by IT 21
 - n. Microsoft Office 97 Professional - mandated by IT 21
6. Some specific systems will require SCSI cards, CD writing capability, or removable hard drives. Currently, critical programs are forced to share information system resources. Increasing the number of computers onboard will eliminate this bottleneck and increase squadron efficiency. A total of thirty-four desktops (34) will be purchased. Total cost for desktops: **\$132,194.35**.
7. The preferred configuration for VFC-13's laptops is:
 - a. Pentium II 233MHz - standard
 - b. 48MB RAM - required to effectively utilize WinNT 4.0
 - c. 3.2GB hard drive - standard
 - d. 3½" floppy - standard

- e. PCMCIA card reader - standard
 - f. 12.1 SVGA display - standard
 - g. 56K PCMCIA card modem (v.90) - industry standard to allow efficient connectivity
 - h. 20X CD-ROM drive - standard
8. Many of the SELRES officers assigned to VFC-13 have jobs involving extensive travel and cannot effectively meet squadron administrative requirements without laptop computers. A total of ten (10) laptops are required. The cost for laptops including software: **\$29,770.00**
9. To provide highly portable computing power and e-mail capability, this squadron requires thirteen (13) 3Com Palm Pilot IIIs. Total cost: **\$8433.00**
10. VFC-13 will require a server for LAN administration. This server will provide necessary security features. The preferred configuration for VFC-13's server is:
- a. Dual Pentium II 350MHz - minimum required to control and administer a 40 client LAN
 - b. 128MB RAM - minimum required for smooth functionality
 - c. Dual PCI Ultra SCSI-3 Controllers - eliminates net lag issues
 - d. Three 4GB Ultra/Wide SCSI-3 hard drives - minimum space for LAN utilities and information sharing, expandable for future growth
 - e. 24x variable speed CD drive - standard
 - f. WinNT 4.0 - required by IT 21
 - g. Tape backup system - provides critical AIS contingency plan backup operations
11. Cost for the server is **\$8,947.00**
12. Using these systems, VFC-13 will become fully IT 21 and Y2K compliant and build an internal LAN.
13. The life cycle of this hardware is expected to be five years. It is unknown if a follow-on system will be required at the end of five years. This requirement should be re-assessed three years after procurement. A full three year on-site service contract for major systems is included in the ASDP. VFC-13 will research third-party service contracts to extend the warranty through the life cycle. Software life cycle is determined by emergent requirements for LAN administration and security, technological improvements and Navy-wide standardization.
14. Total upgrade cost: **\$179,344.35**

1. Command Requirements: Per reference (a), an approved ASDP is required to procure microcomputers, printers, and software. Request **\$128,115.00** blanket authority to procure microcomputers, printers, necessary peripherals and service contracts. Request **\$15,699.00** blanket authority to procure software as necessary.

- 2. TOTAL COST TO UPGRADE VFC-13: \$143,814.00**

- (2) **ALTERNATIVE:** Utilizing existing assets. This will continually impact day to day administrative tasks, communications with Boeing Aircraft Operations (BAO), Commander Naval Air Reserve Force (COMNAVAIRESFOR), Commander Naval Reserve Force (COMNAVRESFOR), Carrier Air Wing Reserve 20 (CVWR-20), and local and area wide users. Additionally, once NAS Fallon upgrades current server, Information Systems not using Microsoft Windows NT will not be supported.

- (3) The recommended preferred software configuration is:
- (a) MS Office 97 Professional
 - (b) MS Windows NT Workstations

Commanding Officer

a. Functions: Executive communications with BAO, COMNAVAIRESFOR and COMNAVRESFOR, CVWR-20, document review, reports, command communications (E-mail) with local and wide area network users, research, enlisted evaluations and officer fitness reports.

b. Current System Configuration:

(1) HARDWARE:

- (a) Pentium 90MHz
- (b) 16MB RAM
- (c) 514MB hard drive
- (d) 3½ floppy drive
- (e) 14" VGA monitor
- (f) HP DeskJet 660C series printer

(2) SOFTWARE:

- (a) WordPerfect 6.0a
- (b) Macfee Virus Scan
- (c) LAN Workplace
- (d) NFS Client for LAN Workplace
- (e) Starmenu
- (f) MS-DOS 6.22
- (g) Windows 3.11

c. Proposed Upgrade:

(1) HARDWARE:

- (a) Pentium II 400MHz
- (b) 64MB SDRAM
- (c) 512K L2 cache
- (d) 8.4GB Ultra ATA hard drive (9.5ms ast)
- (e) 3½ inch floppy drive
- (f) SCM PNP Swapbox PCMCIA
- (g) 17" Trinitron monitor (16" v.i.s., .26dpi)
- (h) MS 104-key enhanced PS2 keyboard
- (i) MS IntelliMouse
- (j) 32-bit Ultra ATA Controller
- (k) 32X variable speed CD-ROM
- (l) 3COM 3C905 10/100 PCI
- (m) Yamaha Wavetable Sound
- (n) Diamond 330.66MHz AGP video card

(2) SOFTWARE:

- (a) MS Office 97 Professional (\$100)
- (b) MS NT Workstation 4.0 (\$200)
- (c) additional software requirements to be submitted in FY-99.

d. TOTAL COST OF HARDWARE: \$2,583

e. TOTAL COST OF SOFTWARE: \$300

f. ON SITE 3 YEAR SERVICE: \$100

g. TOTAL COST: \$2,983

Executive Officer

a. Functions: Executive communications with BAO, COMNAVAIRESFOR, COMNAVRESFOR, and CVWR-20, e-mail with local and wide area network users, research, enlisted evaluations and officer fitness reports.

b. Current System Configuration:

(1) HARDWARE:

- (a) 233MHz notebook
- (b) 16MB RAM
- (c) 1.3GB hard drive
- (d) 3½ floppy
- (e) 12.1" active matrix display
- (f) 28.8Kbps modem
- (g) 8X CD rom
- (h) HP LaserJet 4MV

(2) SOFTWARE:

- (a) MS Office 4.0
- (b) Windows 95

c. Proposed Upgrade:

(1) HARDWARE:

- (a) add 16MB RAM
- (b) Linksys PCMCIA 10/100 Ethernet Card
- (c) Lexmark 7000 printer

(2) SOFTWARE:

- (a) MS NT Workstation 4.0 (\$200)
- (b) additional software requirements to be submitted in FY-99.

d. TOTAL COST OF HARDWARE: \$450

e. TOTAL COST OF SOFTWARE: \$200

e. TOTAL COST: \$650

5. Officer-in-Charge

a. Functions: Executive communications with BAO, COMNAVAIRESFOR, COMNAVRESFOR, and CVWR-20, e-mail with local and wide area network users, research, enlisted evaluations and officer fitness reports.

b. Current System Configuration: **NONE**

c. Proposed Upgrade (**New System Requirement**)

(1) HARDWARE:

- (a) Pentium II 400MHz
- (b) 64MB SDRAM
- (c) 512K L2 cache
- (d) 8.4GB Ultra ATA hard drive (9.5ms ast)
- (e) 3½ inch floppy drive
- (f) SCM PNP Swapbox PCMCIA
- (g) 17" Trinitron monitor (16" v.i.s., .26dpi)
- (h) MS 104-key enhanced PS2 keyboard
- (i) MS IntelliMouse
- (j) 32-bit Ultra ATA Controller
- (k) 32X variable speed CD-ROM
- (l) 3COM 3C905 10/100 PCI
- (m) Lexmark 7000 printer
- (n) Yamaha Wavetable Sound
- (o) Diamond 330.66MHz AGP video card

(2) SOFTWARE:

- (a) MS Office 97 Professional (\$100)
- (b) MS NT Workstation 4.0 (\$200)
- (c) additional software requirements to be submitted in FY-99.

d. TOTAL COST OF HARDWARE: \$2883

e. TOTAL COST OF SOFTWARE: \$300

f. ON SITE 3 YEAR SERVICE: \$100

g. **TOTAL COST: \$3283**

List of other billets with similar computer requirements and prices (as OIC):

Administration Chief
Admin Supervisor/Career Counselor
Command Senior Chief
Administration Officer
Assistant Admin Supervisor
Administrative Yeoman (3 systems)
Administrative Yeoman/Instructions and Notices
Administrative Yeoman/Gate Guard Message
Administrative Yeoman/RSTARS (2 systems)
Legal Officer
Operations Officer
Schedules Officer
Operations Leading Petty Officer
Adversary Pilot Qualification Tracking/Reporting Station
Flight Hour Database Management System
Security Officer
NATOPS Officer
SAFETY Officer
Training Officer
Training Leading Petty Officer
RSTARS Operator
Maintenance Officer
Maintenance Monitoring Team
MMT Administration
MMT Supply
MMT Detachment CPO
Ops Detachment CPO
Classified Detachment Presentation Computer
Squadron Duty Officer Computer

Briefing Presentation and Preparation Computer

a. Functions: Prepares classified and unclassified reports for the command, SME lecture preparation, image acquisition, notes and handout generation, image manipulation and animation for pilot briefs and training.

b. Current system configurations:

(1) HARDWARE:

- (a) Macintosh Power PC 120
- (b) 16MB RAM
- (c) 2GB hard drive
- (d) 3½ inch floppy drive
- (e) 20" radius monitor
- (f) SyQuest 230MB EzFlyer

(2) SOFTWARE:

- (a) MS Office
- (b) After Dark
- (c) Adobe Photoshop
- (d) MacOS 7.5.1

c. Proposed Upgrade:

(1) HARDWARE:

- (a) Pentium II 400MHz
- (b) 64MB SDRAM
- (c) 512K L2 cache
- (d) 8.4GB Ultra ATA hard drive (9.5ms ast)
- (e) 3½ inch floppy drive
- (f) SCM PNP Swapbox PCMCIA
- (g) 17" Trinitron monitor (16" v.i.s., .26dpi)
- (h) MS 104-key enhanced PS2 keyboard
- (i) MS IntelliMouse
- (j) 32-bit Ultra ATA Controller
- (k) 32X variable speed CD-ROM
- (l) RCD 12x/4x CD-R
- (m) 3COM 3C905 10/100 PCI
- (n) Yamaha Wavetable Sound
- (o) Diamond 330.66MHz AGP video card
- (p) PCI SCSI card

(2) SOFTWARE:

- (a) MS Office 97 Professional (\$100)
- (b) MS NT Workstation 4.0 (\$200)
- (c) Adobe Photoshop 5.0
- (c) additional software requirements to be submitted in FY-99.

d. TOTAL COST OF HARDWARE: \$3469

e. TOTAL COST OF SOFTWARE: \$900

f. ON SITE 3 YEAR SERVICE: \$100

g. TOTAL COST: \$4469

Training Room Presentation Computer

a. Functions: Command presentations for guests, CAG-20, COMNAVAIRESFOR, and deployed airwings, command training briefs, aircrew briefings, classified and unclassified briefings.

b. Current System Configuration: **NONE**

c. Proposed Upgrade (**New System Requirement**):

(1) **HARDWARE:**

- (a) Pentium II 400MHz
- (b) 64MB SDRAM
- (c) 512K L2 cache
- (d) 2 rmvble 8.4GB Ultra ATA drive (9.5ms ast)
- (e) 3½ inch floppy drive
- (f) SCM PNP Swapbox PCMCIA
- (g) 17" Trinitron monitor (16" v.i.s., .26dpi)
- (h) MS 104-key enhanced PS2 keyboard
- (i) MS IntelliMouse
- (j) 32-bit Ultra ATA Controller
- (k) Writable DVD CD-ROM
- (l) 3COM 3C905 10/100 PCI
- (m) Yamaha Wavetable Sound
- (n) Diamond 330.66MHz AGP video card

(2) **SOFTWARE:**

- (a) MS Office 97 Professional (\$100)
- (b) MS NT Workstation 4.0 (\$200)
- (c) additional software requirements to be submitted in FY-99.

d. **TOTAL COST OF HARDWARE: \$3964**

e. **TOTAL COST OF SOFTWARE: \$300**

f. **ON SITE 3 YEAR SERVICE: \$100**

g. **TOTAL COST: \$4364**

CBT Training (2 systems)

a. Functions: Command Training, command calendar, rate training, IUT binders, CONTRAC schedules.

b. Current System Configuration:

(1) **HARDWARE:**

- (a) Pentium II 233MHz
- (b) 64MB RAM
- (c) 2GB Hard drive
- (d) 3½ floppy drive
- (e) 17" VGA monitor
- (f) 24X CD ROM
- (g) DeskJet 660C

(2) **SOFTWARE:**

- (a) McAfee Virus Scan
- (b) Starmenu
- (c) Windows 95

c. Proposed Upgrade: **NONE**

d. Provided by CNARF for computer-based training.

Laptops for SELRES department heads (4 systems required, 2 systems currently available)

a. Functions: While deployed communications with wing and command, detachments provide adversary support for fleet/mutual support missions. Prepares and certifies readiness reports. Conduct all administrative functions for assigned detachments, provide correspondence maintenance, parts and aircraft status.

b. Current System Configurations:

(1) HARDWARE:

- (a) Pentium 100MHz
- (b) 16MB SDRAM
- (c) 3½ floppy
- (d) 2.1GB hard drive
- (e) 36.6k fax/modem
- (f) 24X CDROM

(2) SOFTWARE:

- (a) Word Perfect 6.1
- (b) MS-DOS 6.22
- (c) Windows 3.11

c. Proposed Upgrade (** New Systems Required**):

(1) HARDWARE (3 additional systems)

- (a) Pentium 233MHZ
- (b) 32MB RAM
- (c) 3.2GB hard drive
- (d) 3½ floppy
- (e) PCMCIA
- (f) 12.1 SVGA
- (g) 56K US Robotics fax/modem (v.90 compatible)
- (h) 20X CD ROM

(2) SOFTWARE:

- (a) Windows NT Workstation 4.0 (\$200.00)
- (b) Microsoft Office 97 Professional (\$100.00)

TOTAL COST OF HARDWARE: \$10188

TOTAL COST OF SOFTWARE: \$1200

ON SITE 3 YEAR SERVICE: \$400

TOTAL COST FOR 4 SYSTEMS: \$11788

Laptop pool for TAD travel (3 systems required, 1 system currently available)

a. Function: Communications with VFC-13, CVW-20, COMNAVAIRESFOR and COMNAVRESFOR, document review, reports, command communications, e-mail, and assigned administrative requirements.

b. Current System Configurations:

(1) HARDWARE:

- (a) 486/66 MHz
- (b) 3½ floppy
- (c) 16MB RAM
- (d) 340MB hard drive
- (e) 28.8 fax/modem

(2) SOFTWARE:

- (a) MS Office 4.0
- (b) MS-DOS 6.22
- (c) Windows 3.11

c. Proposed Upgrade (** New Systems Required**):

(1) HARDWARE (3 systems):

- (a) Pentium 233MHZ
- (b) 32MB RAM
- (c) 3.2GB hard drive
- (d) 3½ floppy
- (e) PCMCIA
- (f) 12.1 SVGA
- (g) 56K US Robotics fax/modem (v.90 compatable)
- (h) 20X CD ROM

(2) SOFTWARE:

- (a) Windows NT Workstation 4.0 (\$200.00)
- (b) Microsoft Office 97 Professional (\$100.00)

TOTAL COST OF HARDWARE: \$7641

TOTAL COST OF SOFTWARE: \$900

ON SITE 3 YEAR SERVICE: \$300

TOTAL COST FOR 3 SYSTEMS: \$8841

LAN Server

a. Function: provide LAN administration functionality including scheduled back-ups, security, internal communication and information sharing.

b. Current System Configuration: **NONE**

c. Proposed Upgrade:

(1) **HARDWARE:**

- (a) Pentium II 333MHz
- (b) 128MB ECC EDO RAM
- (c) 512K L2 cache
- (d) Three 4GB Ultra/Wide SCSI-3 hard drives
- (e) 3½ inch floppy drive
- (f) 17" Trinitron monitor (16" v.i.s., .26dpi)
- (g) MS 104-key enhanced PS2 keyboard
- (h) MS IntelliMouse
- (i) Dual PCI Ultra SCSI-3 Controllers
- (j) PowerEdge RAID Controller
- (k) 24x variable speed CD-ROM
- (l) Sony Tape Drive backup

(2) **SOFTWARE:**

- (a) Microsoft BackOffice Server (\$2299)
- (b) additional software requirements to be submitted in FY-99.

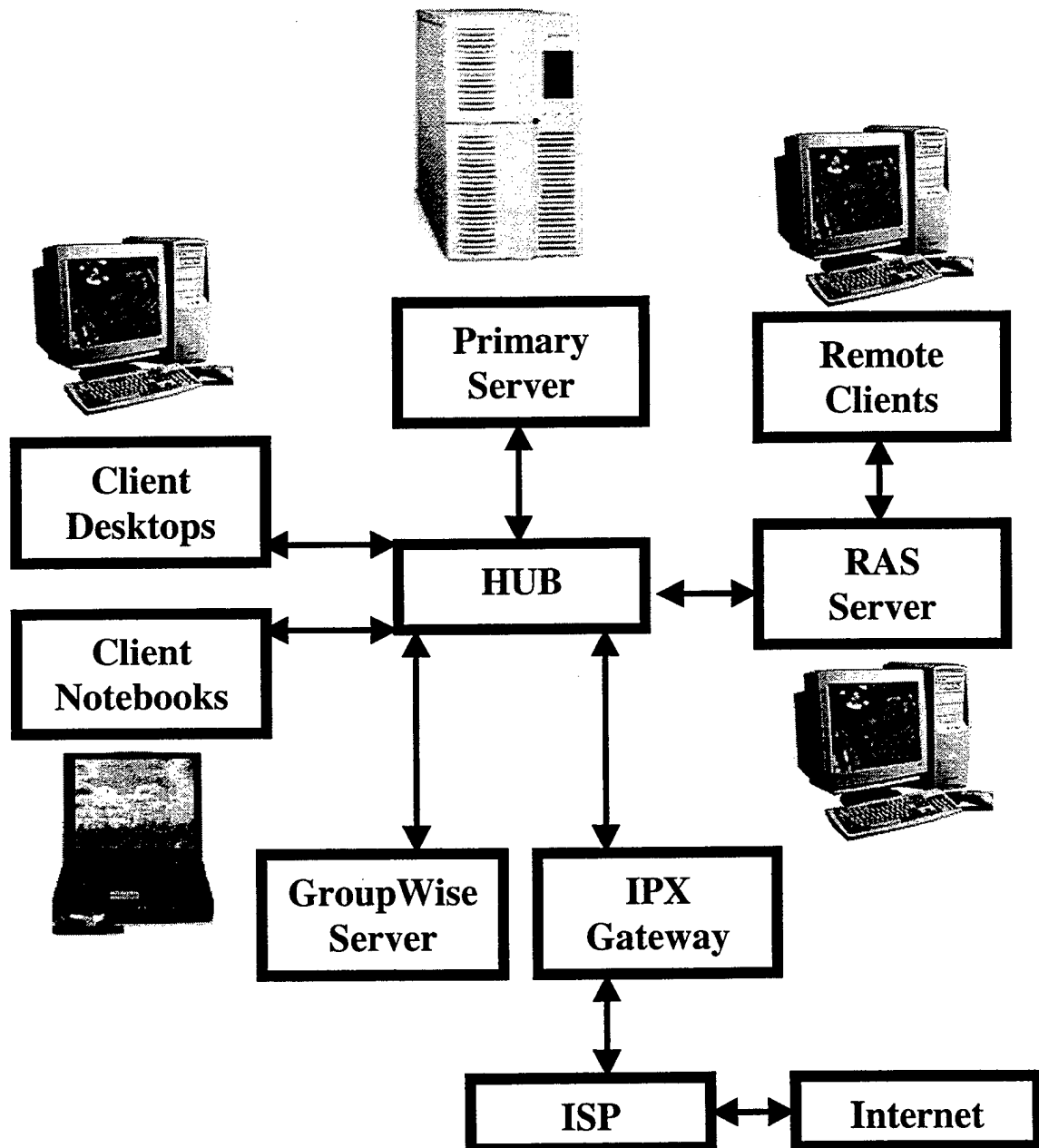
d. **TOTAL COST OF HARDWARE: \$6648**

e. **TOTAL COST OF SOFTWARE: \$2299**

f. **ON SITE 3 YEAR SERVICE: \$100**

g. **TOTAL COST: \$8947**

APPENDIX B. CUSTOMER LAN ARCHITECTURE



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APPENDIX C. WEBSITE SECURITY

I. Security Considerations

This appendix describes general Web hosting security issues and how FrontPage protects Web server security on the Internet Information Server (IIS) Web server for Windows NT. All information obtained from Web server documentation. (Server)

II. General Web Hosting Security Issues

Regardless of what software you are running, the two major security issues when you host Web sites from your computer are:

- Protecting your computer from unauthorized users
Hosting Web sites, even on an Intranet, opens your host computer to a wider community of users. *Authentication* is the process of allowing users access to the Web service based on usernames and passwords or based on IP addresses. Restricting users by IP address is less secure, because clever users can "spoof" an IP address and gain access to the host computer.
- Protecting your computer from programs that run on the host computer
Programs can run on your computer based on the content of a Web site for many reasons. For example:
 - An HTML page that "includes" or "substitutes" another page can cause a program to be run on the host computer.
 - Marking directories executable to allow a script to run on the host computer can allow a program to do anything within the limits of the host computer's resource protection scheme.
 - Saving HTML in general introduces risk. HTML pages can contain embedded controls, scripts, applets, and other programs that can cause programs to run on a host computer. Form handlers can introduce a further risk, because users can submit HTML commands from within form fields, causing programs to be run when the page containing the form results is browsed. (FrontPage form handlers do not allow this.)

III. FrontPage Security Strategy

FrontPage addresses these security issues by using the built-in security mechanisms of the host computer. Using the FrontPage Server Extensions requires no changes to the host computer's security method. You do not have to recompile any Web-server programs and there are no custom filters or other security modifications.

- On IIS Web Servers, each HTTP request to IIS from a Web browser or the FrontPage client runs under a user account on the Windows NT operating system hosting IIS. Windows NT maintains account lists of local users and groups and of users and groups in a domain. The operations that are performed during the

execution of HTTP requests are limited by the capabilities granted to that user account on the Windows NT Server. Windows NT File System (NTFS) allows the association of an *access-control list* (ACL) with any file or folder. An ACL contains users and groups with sets of permissions that allow a user or group to read, write, execute, or delete that file or folder. FrontPage implements Web security on IIS by changing the ACLs for all files and folders in each FrontPage web.

IV. FrontPage Security on IIS Systems

1. Windows NT Security Concepts

Windows NT security helps you protect your computer and its resources by requiring assigned user accounts for all operations. You can control access to all computer resources, including Web content, by limiting the user rights of these accounts. Windows NT maintains account lists of local users and groups and of users and groups in the domain.

Every operation on a Windows NT computer identifies who is doing the operation. The username and password that you use to log on to Windows NT identifies who you are and defines what you are authorized to do on that computer.

What a user is authorized to do on a computer is configured in User Manager by setting User Rights in the Policies menu. User rights authorize a user to perform certain actions on the system, including the right to "Log on locally," which is required for users to use Internet Information Server services under Basic Authentication.

NTFS is the recommended file system choice for Windows NT systems that host Web sites. Windows NTFS allows the association of an *access-control list* (ACL) with any file or directory. An ACL contains users and groups with sets of permissions that control whether or not a user or group can read, write, execute, or delete that file or directory. Windows NT also supports the File Allocation Table (FAT) file system. Because there are no file permissions maintained there, storing web content in a FAT partition completely bypasses FrontPage and IIS access control. You are warned about this when you attempt to install the FrontPage Server Extensions on a FAT partition. To apply security to a Web site, you must either convert the partition from FAT to NTFS or move the content to an NTFS partition. With either solution you will have to uninstall and reinstall the FrontPage Server Extensions.

For more information on Windows NT Security, see Windows NT Server for IS Professionals.

2. IIS Security Overview

A. IIS Authentication

Under IIS design, each HTTP request to IIS from a Web browser (or from the FrontPage client) runs under a user account on the Windows NT computer hosting IIS. The operations that are performed during the execution of that HTTP request are limited by the capabilities granted to that user account on the Windows NT Server.

When IIS receives an HTTP request from a Web browser or from the FrontPage client, it does the following:

1. IIS validates the user against an account (a user/password) from the Windows NT account list, then "impersonates" that account to process the Web request. The request is first attempted as the anonymous account, IUSR_<hostname>. If that execution fails to have sufficient access to complete the request, or if IIS does not have anonymous browsing enabled, then IIS returns error 401 (access denied). At this point, user authentication is performed to allow the remote user to identify themselves using the techniques of Basic Authentication or Windows NT Challenge/Response. If the Web browser or FrontPage client is using Windows NT Challenge/Response, the user may not see a prompt, because the FrontPage client or the Web browser simply supplies the username and password of the logged in user from the client computer.
2. IIS allows access to a file in the Web server only if the NTFS ACL for the file contains the account being impersonated by the Web server, with the correct permissions.

You can restrict IIS access to only authenticated clients (clients that supply a valid Windows NT username and password), or you can allow anonymous access using the anonymous account. When you use authenticated clients, no access is permitted unless a valid username and password are supplied. Password authentication is useful if you want only authorized individuals to access your Web site or specific portions controlled by NTFS. You can have both anonymous logon access and authenticated access enabled at the same time.

B. The Anonymous Account

Each Internet service, such as World Wide Web and FTP, maintains a Windows NT username and password that is used to process anonymous requests. The anonymous account for Web services, IUSR_<hostname>, is automatically created by Internet Information Server during its setup. By default, all Web client requests use this account, and clients are given access to Web content using the IUSR_<hostname> account. When an anonymous account request is received, the WWW service "impersonates" the user configured as the anonymous logon user. The request succeeds if the anonymous logon user has permission to access the requested resource, as determined by the resource's Access Control List (ACL). If the anonymous logon user does not have permission, the request fails. The WWW service responds to a failed anonymous request by requiring that the user provides a valid Windows NT username and password.

C. Basic Authentication

Basic Authentication is supported by the majority of Web servers on the Internet. When using Basic Authentication, the Web browser (or the FrontPage client) prompts the user for a username and password. The username and password are then transmitted across HTTP, lightly encoded using a technique known as *UUencoding*. Using this username and password IIS then authenticates the user as the corresponding Windows NT user. One security risk of Basic Authentication is that usernames and passwords are transmitted across the network in an easily decoded format. However, if your Web site must support authoring by FrontPage 1.1 clients (which do not support NTLM), or if you want to ensure that your Web site is accessible from all browser types, then you must keep Basic Authentication enabled. Furthermore, Basic Authentication is the only authentication technique that works through a firewall via a proxy server. If you are running your Web server over the Internet via a proxy server (as opposed to running it within an intranet) you must use Basic Authentication.

D. Windows NT Challenge/Response

Windows NT Challenge/Response (also called NTLM) is a more secure authentication method than Basic Authentication. In Windows NT Challenge/Response, the Web browser or FrontPage client first attempts to use the Windows NT credentials used to log on to the computer on which the browser or FrontPage client is running. If those credentials are rejected, Windows NT Challenge/Response will prompt the user for a name and password.

The username and password are securely encrypted in a multiple transaction interaction between the client and Web server. This interaction is secure against network snoopers that attempt to break into systems by monitoring network traffic between a client and a server.

There are some limitations of Windows NT Challenge/Response:

- Windows NT Challenge/Response Authentication cannot be performed through a firewall via a proxy. In this case, users must use Basic Authentication.
- Some browsers may not support Windows NT Challenge/Response.
- Windows NT Challenge/Response does not support delegation to third party servers.

Because Windows NT Challenge/Response Authentication cannot be performed through a firewall, it is most useful on intranets, where communication occurs inside an organization's firewall.

You can have both Basic and Windows NT Challenge/Response authentication enabled. If the Web browser supports Windows NT Challenge/Response, it uses that authentication method. Otherwise, it uses Basic authentication. Windows NT Challenge/Response authentication is currently supported only by Microsoft Internet Explorer 2.0 or later.

E. Distributed Password Authentication

The FrontPage Server Extensions supports Microsoft Commercial Internet System Membership service, which uses the Microsoft Distributed Password Authentication (DPA) protocol. DPA is a challenge and response authentication protocol that uses passwords and a trusted third-party authentication server. In DPA, a generic user name in the domain is mapped to a set of users maintained in a database. This lets Internet service providers extend the number of users an NT domain can accommodate. Generic usernames, such as "FrontPage_Authors," are available in the FrontPage Permissions dialog box in the same way as other usernames and groups.

FrontPage client machines that use DPA must have Microsoft Internet Explorer 3.0 (or higher) or Netscape Navigator 2.0 or 3.0. If the client machine is running Microsoft Internet Explorer 3.0, the user must install the Microsoft Internet Explorer 3.0x DPA update. If the client machine is running Netscape Navigator 2.0 or 3.0, the user must install the Microsoft Authentication Proxy for Netscape Navigator update.

F. Windows NT Challenge/Response and Network vs. Local Logon Rights

IIS 2.0 implements Windows NT Challenge/Response and Basic Authentication slightly differently than later IIS versions. When a user is authenticated using Windows NT Challenge/Response, the user is logged on to the Web server computer as a *network* logon. When Basic Authentication is used, the user is logged on with *local* logon rights by default, which is similar to logging on for an interactive session at the computer's console.

In most situations, there are no differences between a network logon and a local logon. The one situation for which this makes a difference is delegation applications. A *delegation application* is one in which part of the Web server's work is delegated to a secondary server process running on a different computer. For example, a Web server that accesses a database server running on a different host computer is a delegation application. If the user has logged on locally, Windows NT security permits those user credentials to be honored by the secondary server. If the user has logged on via the network, those credentials are not honored. Consequently, when using Windows NT Challenge/Response, the database server and Web server must be running on the same host computer.

There are two potential problems caused by Basic Authentication's use of local logon that administrators should be aware of. First, Basic Authentication will not succeed if the user account does not have local logon rights. Even if the FrontPage, IIS, and Windows NT configuration appears to be correct, the lack of local logon rights granted to the user in the Windows NT User Manager will prevent Basic Authentication from authenticating the user. Second, with local logon, if a user can obtain physical access to the host running IIS, the user will be permitted to start an interactive session at the console.

V. The FrontPage Server Extensions on IIS

1. The FrontPage DLLs

In FrontPage, there are three kinds of users defined for every FrontPage web: administrators, authors and browsers (end-users). All permissions are cumulative; all authors also have browsing permission, and all administrators also have authoring and browsing permissions.

In FrontPage, the list of administrators, authors and browsers is defined on a per-web basis. All content in a FrontPage web will be accessible to the same set of users and groups. It is not possible to control permissions on a per-file or per-directory basis with FrontPage. All FrontPage sub-webs either inherit the permissions (list of administrators, authors and browsers) of the FrontPage root web or use their own, unique permissions. Each FrontPage web (including each sub-web) contains copies of three ISAPI DLLs that make up the FrontPage Server Extensions. These DLLs are created in directories below the top-level directory of a FrontPage web:

- **_vti_bin/_vti_adm/admin.dll** for administrative tasks
- **_vti_bin/_vti_aut/author.dll** for authoring FrontPage webs
- **_vti_bin/shtml.dll** for browse-time FrontPage components such as form handlers.

FrontPage performs all authoring and administrative tasks by sending HTTP POST requests to these DLLs. The FrontPage Server Extensions are stored in separate directories in the customer's document root:

```
/document root
  /_vti_bin
    shtml.dll
  /_vti_adm
    admin.dll
  /_vti_aut
    author.dll
```

2. FrontPage Access Control List Settings

FrontPage implements web security on IIS by changing the access-control lists (ACLs) for all files and directories in each FrontPage web. FrontPage controls who can administer a FrontPage web by setting the ACL on **admin.dll**, the administrative DLL. Similarly, FrontPage sets authoring permissions by setting the ACLs on **author.dll**. The default ACL sets browsing permission on Web content and lets all users execute the run-time DLL, **shtml.dll**.

You set the ACLs for a FrontPage web using the FrontPage Explorer's Permissions command, on the Tools menu. To add new users and groups, this command makes the Windows NT computer account list available. In FrontPage 98, you can set up a restricted list of users and groups that does not expose the entire contents of the Windows NT computer and domain account lists. This lets you protect the confidentiality of your user community. For details, see [Restricting Windows NT Account Lists](#).

FrontPage sub-webs can have unique permissions by maintaining separate access-control lists on their own copies of the admin.dll, author.dll and shtml.dll DLLs. Alternatively, a FrontPage sub-web can inherit the permissions of the root web by keeping the access-control lists on its admin.dll, author.dll and shtml.dll the same as the root web's lists. The set of ACLs for a FrontPage web is illustrated in the following two diagrams. The first diagram shows the ACLs for the content of a FrontPage web: the directories, files, and executable files that an author creates. The second diagram shows the ACLs for the FrontPage _vti directories.

Note in these diagrams that two sets of permissions are given. The first set applies to the directory, and the second set applies to the files in the directory. For example, the permissions (rx) (r) specify read and execute-permissions on the directory but only read permissions on the files in the directory.

For the complete set of ACLs set on FrontPage files, along with a list of the entire contents of a FrontPage installation, see FrontPage Windows NT File Permissions.

Notes:

- All FrontPage ACLs have full control (all) (all) for Windows NT Administrators group members and the SYSTEM account.
- The root web root directory's ACL is the same as the default ACL, except that the interactive and network accounts have (rx), or list files, access to the directory only (not to the content of the directory). This access is required in order to list sub-webs in the FrontPage Explorer. The top-level directory of sub-webs does not require these additional accounts, therefore sub-web root directories use the default ACL.
- The Executable ACL is applied to directories that are marked with an executable virtual root. For the web server to run application or script files in response to browser requests, the web server's virtual root must be marked executable in addition to having the executable permission on the file's ACL. FrontPage will set up both of these conditions when folders are made executable using the FrontPage Explorer's **Folder Properties** dialog box.

The Executable ACL is allowed only if the AllowExecutableScripts=1 setting is present for the FrontPage web in the FrontPage configuration file **frontpg.ini** (either globally or on a per-web basis). The default for AllowExecutableScripts is off. If AllowExecutableScripts is off for a FrontPage web, the Executable ACL will never be applied and the default ACL is used even if the directory is marked executable. In IIS 2.0 and IIS 3.0, the execute permission granted in the Executable ACL affects all files in a directory, including EXEs, DLLs, and interpreted scripts such as .ASP and .PL files. On IIS 4.0, the execute permission affects only DLLs and EXE files, and, depending on the server configuration, may not affect interpreted script files.

- The Result File ACL is used only on files that contain the results of a form that uses the FrontPage default form handler. For a Discussion form handler, this ACL is placed on the directory for that discussion. This ACL grants write and delete access to users of the FrontPage web.
- If, in the FrontPage Explorer's **Permissions** dialog box, the setting "Everyone has browse access" is selected, anonymous browsing for a web is implemented. This is done by adding the anonymous account IUSR_<hostname> to the default ACL.

3. FrontPage and System DLLs

On Windows NT, a DLL that is called from another DLL must run under the same user account as the calling DLL. Therefore, all system DLL code that is run as a consequence of an IIS request must run on the impersonated user's permissions. The FrontPage DLLs admin.dll, author.dll, and shtml.dll contain calls to Windows NT system DLLs. To ensure that the system DLLs will have the correct level of permissions to run under any administrator, author, or end-user's account, FrontPage adds the Interactive and NETWORK accounts to the ACLs of any system DLLs that are used as a result of a FrontPage DLL call. These added users are given "read" and "execute" permissions on the system DLLs. Note that this is necessary when installing any generic CGI scripts that use any Windows NT system services on a Web server. Because FrontPage makes calls to Windows NT system DLLs:

- Some shared FrontPage DLLs in the \winnt\system directory are made accessible to impersonated users.
- Some core system DLLs that implement APIs for core system services are made accessible to impersonated users.

[Click here for the full list of system DLLs affected by FrontPage.](#)

4. Virtual FrontPage Directories

Virtual directories are IIS 2.0 and IIS 3.0 constructs that map the URL space of the Web site onto the file system of the local computer. They control read and execute access to specified directories within the file system and allow seemingly related URLs to refer to noncontiguous content areas in the file system.

FrontPage automatically manages the use of virtual directories for executable and unreadable directories. When installed, FrontPage sets up virtual directories in each FrontPage web to mark the directories that contain the FrontPage Server Extension DLLs as executable and to mark hidden directories as unreadable. FrontPage creates the following virtual directories for each sub-web:

- _vti_bin
- _vti_bin_vti_aut
- _vti_bin_vti_adm
- _vti_pvt
- _vti_cnf

- `_vti_txt`

The root FrontPage web has a seventh virtual directory:

- `_vti_log`.

In the FrontPage Explorer, authors can mark directories executable to allow the directories to store executable objects such as Active Server Pages (ASP), Database Connector files (IDC), CGI Scripts, ISAPI Extensions, and Perl scripts. Each directory that is marked executable causes FrontPage to create a virtual directory.

5. Restricting Windows NT Account Lists

In FrontPage 98, you can set up a single user and group list for each virtual root FrontPage web. This lets you protect the confidentiality of your user community by not displaying the full Windows NT account list. To globally enable Windows NT computer account list restrictions, add the following line to your `frontpg.ini` file, located in the `\Winnt` directory:

```
[FrontPage 3.0]
```

```
RestrictIISUsersAndGroups = 1
```

Setting the value to 1 enables restrictions. This same line can also be added for a specific virtual root FrontPage web, for example:

```
[Port 157.55.49.66:80]
```

```
RestrictIISUsersAndGroups = 1
```

A setting of `RestrictIISUsersAndGroups=0` can be used to explicitly disable restrictions, allowing you to set restrictions by default to enabled for all FrontPage Webs except for those where restrictions are explicitly overridden. The default for the global setting is that restrictions are off if the `RestrictIISUsersAndGroups` key is missing. The default for individual FrontPage webs is to inherit the global setting.

If users and groups restrictions are enabled for a given FrontPage web, the Server Extensions look for a Windows NT group named in the following convention:

```
FP_[ServiceName] [_Subweb]
```

On a multihosted IIS2.0/3.0 machine `[ServiceName]` is the service's IP address and port number combination and `[_Subweb]` is the name of the sub-web. On a single-hosted machine, the `ServiceName` portion is simply the port number.

On IIS 4.0, `[ServiceName]` can be of the form `/LM/W3SVC/<N>`, where `<N>` is an instance number. This is the recommended method. On IIS 4.0, `[ServiceName]` can also be of the form `<virtual_server>:<port_number>`. If you use this form, you must use specify the virtual server's name; you cannot use the virtual server's IP address on IIS 4.0.

To specify a root web's restriction group, omit the `_Subweb` portion.

Some examples are:

```
FP_157.55.49.66:80_MySubweb
```

```
FP_80_MySubweb
```

```
FP_80
```

```
FP_/LM/W3SVC/1_MySubweb
```

If restrictions are enabled on a sub-web but no local group is defined, the FrontPage Server Extensions look for the group of the root web and use it if found. If no

appropriately named groups are found then no restriction is placed on permissions visibility setting or contents.

6. Making a Directory Unreadable

A standard way of saving form results in FrontPage is to use the default form handler (also called the WebBot Save Results component) to write to a results file in a directory in a FrontPage web. In FrontPage 1.1 and FrontPage 97, writing form results to a directory made the contents of the directory readable to any user who discovered the URL of the results file.

In FrontPage 98, authors can assign a virtual directory mapping for a form results directory that has both the execute and the read bits turned off. This prevents any end-user from reading the contents of the directory, but it requires the FrontPage web author to fetch the contents of the directory using the FrontPage Explorer.

To make a directory unreadable, select it in the FrontPage Explorer's **Folders** view and select **Properties** from the **Edit** menu. In the **Folder Properties** dialog box, deselect the two settings: **Allow scripts or programs to be run** and **Allow files to be browsed**.

Note that if you make the **/_private** directory unreadable, some FrontPage Wizards will not work properly.

APPENDIX D. FRONTPAGE98 EDITOR KEY FEATURES

You can create new HTML pages based on page wizards and templates. The FrontPage Editor offers many choices of page formats, and you can create your own templates. (Editor)

You can apply one of the many FrontPage themes, created by professional designers, to give your pages a dynamic, colorful appearance. You can also add and design borders for your pages and insert navigation bars, which guide your users around your Web site.

You can open any HTML file in the FrontPage Editor and all the HTML tags on the page are preserved. You can also open files of many popular types, and the FrontPage Editor converts them to HTML. Some of the file types you can open are Microsoft Word 2.0 and 6.0, Microsoft Word 6.0 for MS-DOS, Microsoft Word 95 and 97, Microsoft Excel 4.0 and 5.0, Microsoft Excel 95 and 97, and WordPerfect 6.x. The FrontPage Editor preserves hyperlinks from Microsoft Office 97 documents.

You can insert text in all HTML styles, create multilevel lists, change text size and color, and apply formatting such as centering a heading or making text italic. Using cascading style sheet support, you can control margins, line spacing, colors, fonts faces and sizes.

Using a point-and-click interface, you can create hyperlinks to pages and files in your FrontPage web or to pages and files on the World Wide Web. Point to a page and FrontPage creates the correct hyperlink syntax for you automatically.

You can insert an image of almost any type, and the FrontPage Editor converts it into GIF or JPEG format. Double-click an image and it opens for editing in your favorite image-editing program. Create an image map by adding hotspots, areas in an image containing hyperlinks. Using FrontPage image-editing commands, you can crop, rotate, and resize an image, make it black and white, give it beveled edges, and change its brightness and contrast. FrontPage includes the Microsoft Clip Gallery, a large library of clip art, stock photos, and video clips.

You can create forms containing text fields, check boxes, radio buttons, drop-down lists, and push buttons. When you create a form, the default FrontPage form handler automatically saves form information to a file or sends it to an e-mail address. You can

select from a set of FrontPage form handlers or add you own custom form handler to a form.

A form is a collection of form fields on a page and a form handler, which is a method of collecting information from the form. Forms are a key to making your FrontPage web interactive. Users can "talk back" to your FrontPage web by filling in forms in your FrontPage web and submitting them. The layout of a form can include form fields, text in all paragraph styles, tables, images, and most other objects that can be inserted on a page. In FrontPage, you create forms and fields using an easy to use, point-and-click interface. (FrontPage98 Intranet)

A user fills in a form by typing into text fields, clicking radio buttons and check boxes, and selecting options from drop-down menus. The user then submits the form by clicking a button, usually labeled "Submit." When this happens, FrontPage adds the contents of the form to a file in your FrontPage web. This is the file you will periodically open to gather the collected information from the form. You can also configure a form to send its data to an e-mail address.

A form's handler is not visible to a user but is associated with a form by FrontPage. It starts its operation when a user submits the form. FrontPage automatically assigns a default form handler to each form that you create. You can also select from a set of FrontPage form handlers or add you own custom form handler to a form.

The uses of forms on the World Wide Web are always evolving. Some typical uses include collecting names, addresses, telephone numbers, e-mail addresses, and other information to register users for a service or event, collecting feedback about a Web site, or gather information for the purchase of an item or service.

Using the FrontPage table-editing commands, you can create a table, insert rows and columns, align them, and create background colors, using a point-and-click interface.

You can add powerful functionality to your page by inserting FrontPage components. They add interactive features such as navigation bars, threaded discussion groups, full-text searches, and form handlers that would otherwise require complex programming. For example, the Table of Contents component automatically creates an HTML outline of your FrontPage web with hyperlinks to each page, and the Banner Ad Manager replays a sequence of images using effects similar to a rotating billboard.

You can create new frames pages, edit the appearance of your frames, and assign initial pages to each frame, all using a point-and click interface. FrontPage displays your frames pages in WYSIWYG style and generates the HTML.

You can insert ActiveX Controls, plug-ins, and Java applets in the FrontPage Editor. You can launch a script-editing session and create and insert JavaScript scripts and Microsoft Visual Basic Scripting Edition scripts.

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APPENDIX E. FRONTPAGE98 EXPLORER KEY FEATURES

You can quickly create professional-looking Web sites using the built-in web templates and wizards. For example, you can create a corporate presence on the World Wide Web with the Corporate Presence Wizard; launch a Customer Support site with the Customer Support Web template; host a discussion group with the Discussion Web Wizard; or publish a project management web with the Project Web template. (Explorer)

If you have an existing Web site, you can easily convert it to a full-featured FrontPage web with the FrontPage Explorer's Import Web Wizard. In a few steps, this wizard imports your pages, images, and files, while preserving the web's structure as well as its hyperlinks.

You can import files to your FrontPage web by specifying a folder in your file system to import its contents. You can also export files from your FrontPage web to your file system.

You can display and maintain the files, folders, hyperlinks, and layout of a FrontPage web by selecting any of the FrontPage Explorer's seven views. Each view gives you a different perspective of a FrontPage web, designed to assist you in maintaining FrontPage webs from their creation until their publication to a Web server.

In the FrontPage Explorer, you can apply one or more shared borders — page regions that are reserved for content that you want to appear consistently throughout your pages. Shared borders usually contain navigation bars — hyperlinks to the other pages in the current FrontPage web. When you create a FrontPage web in the FrontPage Explorer's Navigation view, FrontPage can create shared borders and navigation bars that are automatically updated whenever you add, move, or delete pages from the web's structure.

FrontPage includes a gallery of professionally designed graphics and color schemes — called themes — that can be applied to any FrontPage web. Themes enhance the appearance of list bullets, fonts, navigation bars, table borders, horizontal lines, and page backgrounds, and they lend an attractive and consistent appearance to any FrontPage web.

You can double-click any HTML page in the FrontPage Explorer and it will open for editing in the FrontPage Editor. In the FrontPage Explorer, you can also associate

other editors for other file types in your FrontPage web. When you double-click a file that has been associated with an editor, it will open in that editor.

When your FrontPage web is ready to be published on the World Wide Web — or on your organization's intranet — the FrontPage Explorer's Publish command transfers the pages and files to the World Wide Web or a Web server while automatically verifying the addresses of pages and the paths to your files.

If you use the FrontPage Explorer to rename or move a file in your FrontPage web, all hyperlink references to that file are automatically updated within the FrontPage web, including hyperlinks from Microsoft Office 97 documents. You can also verify and repair broken hyperlinks, including hyperlinks to external World Wide Web sites. In a multi-authoring environment, you can refresh hyperlinks to incorporate and view recent changes made to the FrontPage web by other authors.

Using the Tasks view in the FrontPage Explorer, you can track and complete any unfinished FrontPage web tasks (such as spell-checking corrections) on all pages. Clicking a task can take you right to the page that needs work. Some tasks are generated automatically as you create and maintain a FrontPage web; you can add other tasks and assign them to other FrontPage authors.

In multi-user environments, you can protect a FrontPage web from unauthorized access by requiring a logon username and password for browsing or authoring access.

APPENDIX F. FRONTPAGE98 SERVER EXTENSIONS

1. Introduction

The FrontPage Server Extensions are a set of programs on the Web server that support (Server):

(1) Authoring FrontPage webs. For example, when an author moves a page from one folder to another in a FrontPage web, the Server Extensions automatically update all hyperlinks to that page from every other page and Microsoft Office document in the FrontPage web, directly on the Web server machine.

(2) Administering FrontPage webs. For example, a FrontPage web administrator can specify which users can administer, author or browse a FrontPage web.

(3) Browse-time FrontPage web functionality. For example, users of a FrontPage web can participate in a discussion group. The Server Extensions will maintain an index of hyperlinks to articles in the discussion, separate discussion threads, tables of contents, and search forms to locate pages of interest.

A FrontPage web is a project containing all the pages, images, and other files that make up a Web site. For a full description of FrontPage webs, see FrontPage Webs. The design of the FrontPage client and Server Extensions minimizes the need for costly file transfers over the Internet. When an author using the FrontPage Explorer opens a FrontPage web from a Web server containing the Server Extensions, information about the FrontPage web, such as its hyperlink map, is downloaded to the client machine so that the FrontPage Explorer can display the information. However, the full set of pages and other files that comprise the FrontPage web remain on the Web server machine. A page is only downloaded over the Internet when it is opened for editing in the FrontPage Editor. This is a very efficient mechanism: an entire Web site can be changed directly on a Web server at the cost of downloading and editing a single file.

When a Web server machine has the FrontPage Server Extensions, FrontPage web authoring and administering functionality is available from a PC or Macintosh computer that has the FrontPage client program and that is on the Internet or an a local Intranet. The browse time functionality of the Server Extensions is available from any Web browser on the Internet or Intranet.

Communications between a client computer and a Web server containing the Server Extensions uses the same open, ubiquitous HTTP protocol that Web browsers on a

client computer use to interact with a Web server. No file-sharing access on the Web server machine is needed, nor are FTP or telnet access required. No proprietary file system sharing calls are necessary.

The Server Extensions are designed to work with any standard Web server using the Common Gateway Interface (CGI), the near-universal Web server extension mechanism. This includes freeware and shareware servers such as those from Apache, CERN and NCSA, and commercial web servers from Netscape, Microsoft, and O'Reilly and Associates. The Server Extensions are designed to be easily ported to all popular hardware and software platforms for cross-platform Web server compatibility. See FrontPage Server Extensions: Supported Platforms for a complete list of the operating systems and Web servers for which the Server Extensions are available.

On Windows Web servers, the Server Extensions are integrated with Microsoft Visual SourceSafe and support version control and check-ins and check-outs of files from the Web server. The Server Extensions are also used by Microsoft Visual InterDev in the same way that they are used by Microsoft FrontPage.

2. Front Page Webs

FrontPage works with World Wide Web content by managing *FrontPage webs*. You can think of a FrontPage web as a project. It contains all the pages, images, and other files that make up a Web site. Authors can create, delete, open, and close FrontPage webs using the FrontPage Explorer and FrontPage Editor on a client computer. A FrontPage web can be stored on a remote Web server computer, a Web server running on the same computer as the client program, or in the client computer's file system.

Many of the features of a FrontPage web require the FrontPage Server Extensions to be on the server containing the FrontPage web. Some of the features of FrontPage webs that are supported by the FrontPage Server Extensions are:

(1) A *full hyperlink map* of all files in a FrontPage web. The FrontPage Explorer displays hyperlinks using this hyperlink map. When a FrontPage web is copied from one Web server to another, the entire hyperlink map is recalculated.

(2) A *full-text index* of all Web pages in a FrontPage web. This lets end-users search a FrontPage web for pages containing words or phrases.

(3) A *persistent structure* that authors can create and manipulate. This structure defines the key pages in a FrontPage web and the relationships among these pages. Authors operate on the structure of a FrontPage web in the FrontPage Explorer. When the

structure of a FrontPage web is changed, affected pages are updated to reflect the changes.

(4) *Web themes*. A theme is a set of color-coordinated page elements, including background colors, text colors, bullets, borders, and horizontal lines. By applying a theme to a FrontPage web, an author can easily give a FrontPage web a consistent, attractive appearance. When a new theme is applied to a FrontPage web, all pages are automatically updated to use it.

(5) A *Tasks list* containing the tasks needed to complete a FrontPage web. Tasks are linked to the pages on which they occur.

(6) *Unique security settings*. Each FrontPage web can be made available to a different group of administrators, authors and end-users.

FrontPage supports two kinds of FrontPage webs: *root webs* and *sub-webs*. A root web is a FrontPage web that is the top level content directory of a Web server or, in a multihosting environment, of a virtual Web server. It can have many levels of subdirectories, containing its content. There can be only one root web per Web Server or virtual Web server.

A single root web can support a number of sub-webs. A sub-web is a complete FrontPage web that is a subdirectory of the root web. Sub-webs can only exist one level below the root web. Each sub-web can have many levels of subdirectories, making up its content. Sub-webs cannot have sub-webs.

Even though sub-webs appear below the root web in the Web server's file system and URL space, the root web does not include the content in its sub-webs. This separation of content is done by the FrontPage Server Extensions.

The root web and all sub-webs on a server have separate copies of the Server Extensions installed, or have stub executables of the Server Extensions programs. Having separate Server Extensions copies for each FrontPage web lets the Web server enforce different end-user, author, and administrator permissions on each FrontPage web, since FrontPage uses the Web server's built-in security mechanism to control access.

FrontPage webs can be implemented on a Web server and accessed by Web browsers in the following ways:

(1) As private domain names, such as "www.mycompany.com." These are usually implemented as virtual servers on the same physical server machine using *multihosting*. Private domain name customers each get their own root web and have the option of creating sub-webs.

(2) As a common or shared domain but with private virtual servers, as in "www.mycompany.myprovider.com," where "myprovider.com" is a shared domain and "www.mycompany" is a private virtual server. Private virtual server customers on a shared domain each get their own root web and have the option of creating sub-webs.

(3) As a URL on an Internet service provider's server machine, as in "www.myprovider.com/mycompany." URL customers get a single sub-web.

3. FrontPage Authoring Support

In FrontPage, authors create Web pages and entire Web sites using FrontPage on a client computer (a PC or Macintosh). The FrontPage client programs are the *FrontPage Explorer* and the *FrontPage Editor*.

(1) The FrontPage Explorer is the FrontPage tool for creating, designing, viewing, maintaining, and publishing FrontPage webs. Various views in the FrontPage Explorer provide different ways of looking at and modifying the contents of a FrontPage web.

(2) The FrontPage Editor is the FrontPage tool for creating, editing, and testing World Wide Web pages. As an author adds text, tables, forms, images, controls and other elements to a page, the FrontPage Editor displays it in WYSIWYG style, as it would appear in a Web browser. The FrontPage Editor is fully integrated with the FrontPage Explorer.

Much of the FrontPage Explorer and Editor's functionality is supported by the FrontPage Server Extensions. Some examples are:

- (1) Saving documents to FrontPage webs.
- (2) Creating, copying, and publishing FrontPage webs.
- (3) The Tasks view, containing a list of tasks needed to complete a FrontPage web.

(4) FrontPage web-structure editing. An author defines the structure of a FrontPage web in the FrontPage Explorer's Navigation View and inserts navigation bars in the FrontPage Editor. FrontPage navigation bars automatically create the hyperlinks that express the FrontPage web's structure. If the author changes the structure in the Navigation View, all FrontPage navigation bars automatically update these hyperlinks.

(5) FrontPage components (also called WebBot components). FrontPage includes a rich set of active components that update pages when a change occurs in the FrontPage web. For example, the Table of Contents component keeps an updated table of contents of the entire FrontPage web. When an author moves a page, the table of contents is

updated. Another FrontPage component, the Include component, inserts the contents of one page into another. If the inserted page changes, all pages that include it are automatically updated.

(6) Hyperlink map. A FrontPage web's hyperlink map is browsable in the FrontPage Explorer's Hyperlink View. Using this map, FrontPage updates affected hyperlinks in the FrontPage web when a page is moved or renamed.

(7) Themes. Authors select FrontPage web themes in the FrontPage Explorer, or they can apply a theme to a single page in the FrontPage Editor. When the theme for a FrontPage web changes, FrontPage automatically updates every page in the FrontPage web to use the new theme.

4. FrontPage Administrative Support

The FrontPage Server Extensions provides a set of web-administration tools that can be used remotely from the FrontPage Explorer. These tools provide access control and general Web-administration functionality. The Server Extensions support three levels of access control of FrontPage webs: administrator, author, and browser.

(1) *Administering permission* gives a user, group of users, or a computer permission to administer the FrontPage web.

(2) *Authoring permission* gives a user, group of users, or a computer permission to open the FrontPage web in the FrontPage Explorer and edit its pages and files.

(3) *Browsing permission* gives a user, group of users, or a computer permission to browse the FrontPage web when it is published on the Internet or on an intranet.

For a full discussion of FrontPage Server Extension administrative capabilities, along with a general discussion of Server Extensions security issues, see [The FrontPage Server Extensions: Security Considerations](#).

5. FrontPage Browse-time Support

FrontPage *browse-time* support occurs when a user views a page in a FrontPage web from a Web browser. Browse-time support is implemented in the FrontPage Server Extensions as *FrontPage components* (also called *WebBot components*).

A FrontPage component is an active object that is inserted on an HTML page using the FrontPage Editor. It has a persistent state that is encoded as HTML comments. FrontPage components typically produce as their output HTML that is inserted in the surrounding HTML page. FrontPage components can be active at authoring-time, while

the FrontPage Editor and Explorer are in use, or at browse-time. For example, the Include component is an authoring-time component that includes the contents of one page in another.

Some browse-time FrontPage components are:

A. SEARCH FORM

The Search Form uses the full text index created by the Server Extensions. It appears as a form on a page. When a user submits a Search Form containing words to locate, the Search Form returns hyperlinks to all pages in a FrontPage web that contain the words.

B. E-MAIL FORM HANDLER

The E-mail Form Handler gathers information from a form, formats the information, and sends it to an e-mail address.

C. DISCUSSION FORM HANDLER

The Discussion Form Handler lets users participate in an online discussion. It collects information from a form, formats it into an HTML page, and adds the page to a table of contents and to a text index.

When a user browses an HTML page containing a browse-time FrontPage component, the Server Extensions do whatever processing is required and then generate a new HTML page to display the results of the operation. For example, a Search Form will generate an HTML list of hyperlinks to pages and an E-mail Form Handler will generate a page confirming that a form's contents have been processed and sent to an e-mail address.

An HTML page with no browse-time FrontPage components does not use the Server Extensions when a user browses the page. Instead, the normal Web server page-retrieval process occurs.

6. Publishing FrontPage Webs

Publishing a FrontPage web means making the FrontPage web available to users for browsing from a Web server, either on an intranet or on the Internet. The Internet and intranet cases typically use different methods of publishing.

In Internet publishing, the most common method is for an author to create a FrontPage web on a Web server installed on the client computer. (When the FrontPage client program is installed, FrontPage optionally installs a Web server with the Server Extensions on the client computer.) Then, when the FrontPage web is completed and tested, the author publishes it to an Internet service provider's Web server using the FrontPage Explorer's Publish FrontPage Web command. Authoring on a local Web server is efficient because it does not require an author to be connected to an Internet service provider while working on a FrontPage web.

The Publish FrontPage Web command copies the FrontPage web from a source (desktop) Web server to a destination (production) Web server in batch mode. Only new or changed pages and files are copied by default. Pages and files deleted from the source FrontPage web are also deleted from the destination web.

When an author publishes a FrontPage web using the Publish FrontPage Web command, the home page is renamed, if necessary, to match the naming-convention on the destination Web server. Also, all FrontPage components in the FrontPage web are regenerated to take advantage of platform-specific functionality. For example when a FrontPage web is published to an IIS server containing Microsoft Index Server, any Search Forms are configured to use the Index Server.

In Intranet publishing, the most common method does not require the Publish FrontPage Web command. Instead, an author works directly on a Web server machine on an internal network, which is typically used to share information inside an organization. In this method, whenever a page is opened from the Web server and edited, the change is published to the intranet when it is saved from the FrontPage Editor.

7. FrontPage Product Architecture

The FrontPage client system communicates with a Web server via the FrontPage Explorer. The library dedicated to communicating from the client is the WEC (Web Extender Client), a private FrontPage library. This library communicates via Winsock and TCP/IP. Wizards and custom applications on the client communicate with the Editor and Explorer using OLE automation.

The FrontPage client tools communicate with the Server Extensions using HTTP, the same protocol used to communicate between Web browsers and Web servers. FrontPage implements a remote procedure call (RPC) mechanism on top of the HTTP "POST" request, so that the FrontPage client can request documents, update the Tasks

list, add new authors, and so on. The Web server sees "POST" requests addressed to the Server Extensions CGI programs and directs those requests accordingly. FrontPage correctly communicates between client and server through firewalls (proxy servers). FrontPage does not use or require the HTTP "PUT" request. As described in the HTTP specification, "PUT" sends a document to a Web server. However, few Web servers implement "PUT." Therefore, FrontPage uses the universally-implemented HTTP "POST" request for all communications with the Server Extensions.

For most web servers, the Server Extensions are accessed by the Web server using the Common Gateway Interface (CGI), the near-universal Web server extension mechanism. The implementation of CGI differs somewhat among Web servers and platforms. For example, most Unix web servers invoke a CGI extension by running it in a separate fork, whereas some Windows NT web servers support a Dynamic Link Library (DLL) variant of CGI-style communication that incurs less overhead. But the information flow is similar for all CGI implementations: user-driven values and environment parameters are passed to the CGI extension using a block of name/value pairs, and the CGI extension program returns a result in HTML format.

The Server Extensions are divided into three libraries:

- (1) *admin.dll* for FrontPage web administration
- (2) *author.dll* for FrontPage web authoring support
- (3) *shtml.dll* for browse-time support

8. FrontPage Extensibility

FrontPage is extensible in the following areas:

- (1) Web wizards and page wizards
- (2) Web themes and page themes
- (3) Menu commands
- (4) FrontPage components

The Microsoft FrontPage Software Developer's Kit, which is included on the FrontPage CD-ROM in the \SDK folder, contains full documentation for adding these features, including examples and sample code.

9. FrontPage Client and Server Extensions Compatibility

The FrontPage Server Extensions exist for FrontPage client versions 1.1, FrontPage 97, and FrontPage 98. Each FrontPage client release is accompanied by a new

Server Extensions release that supports the new features of the client. For example, the current release, FrontPage 98, is accompanied by a new FrontPage 98 Server Extensions release. It is always most effective to use the most up-to-date versions of the FrontPage client and the Server Extensions.

Each new release of the Server Extensions is backward compatible with previous FrontPage client versions so that it continues to support the client's functionality at each earlier level. For example, a FrontPage 97 client can open and edit a FrontPage web from a Web server that has the FrontPage 98 Server Extensions installed with no loss of functionality in the FrontPage 97 client. However, the client will not be able to access new Server Extensions functionality added for the FrontPage 98 client such as applying themes to a FrontPage web or creating and saving a FrontPage web structure.

A FrontPage client can also open and edit FrontPage webs on a Web server containing an earlier version of the Server Extensions. However, the client will not be able to use its newer features, because they will not be supported by the earlier version of the Server Extensions.

Bug fixes and patches are occasionally issued for the current released version of the Server Extensions . Older versions of the Server Extensions do not receive these occasional updates. However, patches to the current version of the Server Extensions will work with earlier versions of the FrontPage client.

10. FrontPage Server Extensions: Supported Platforms

The following table provides the complete list of operating systems and Web servers for which the FrontPage Server Extensions are available.

On the following operating systems:	The FrontPage Server Extensions are available for the following Web servers:
<p><u>UNIX</u></p> <p>Digital UNIX 3.2c, 4.0 (Alpha) BSD/OS 2.1 (Intel x86) BSD/OS 3.0 (Intel x86) Linux 3.03 (Red Hat Software) (Intel x86) HP/UX 9.03, 10.01 (PA-RISC) IRIX 5.3, 6.2 (Silicon Graphics) Solaris 2.4, 2.5 (SPARC) SunOS 4.1.3, 4.1.4 (SPARC)</p>	<p>Apache 1.1.3, 1.2 CERN 3.0 NCSA 1.5.2 (we do not support 1.5a or 1.5.1) Netscape Commerce Server 1.12 Netscape Communications Server 1.12 Netscape Enterprise Server 2.0, 3.0 Netscape FastTrack 2.0</p>
<p><u>Windows NT Server, Windows NT Workstation, and Windows 95</u></p> <p>Intel x86 Win 32</p> <p>Windows NT Server 4.0 or higher, Windows NT Workstation 4.0 or higher</p>	<p>Internet Information Server 2.0 or higher, including IIS 4.0 Microsoft Peer Web Services (on Windows NT Workstation) Netscape Commerce Server 1.12 Netscape Communications Server 1.12 Netscape Enterprise 2.0 and 3.0 Netscape FastTrack 2.0 O'Reilly WebSite Microsoft Personal Web Server (on Windows 95) FrontPage Personal Web Server</p> <p>Microsoft Internet Information Server 2.0 or higher, including IIS 4.0 Microsoft Peer Web Services (on Windows NT Workstation)</p>

APPENDIX G. MICROSOFT OFFICE97 KEY FEATURES

Creating and Contributing to an Intranet Using Microsoft Office 97 (Office)

No doubt about it— intranets today are hot! Maybe your job has something to do with your company's network. Or maybe you're familiar with the Internet, and you wonder whether there is an intranet in your professional future. Chances are, you will work with an intranet sooner than you think—especially if you decide to build one yourself.

But just what is an intranet? Simply put, an intranet is a corporate network designed around Internet metaphors, protocols, and technology. Like a collection of shared folders on a server, an intranet gives you and your coworkers the ability to save files, content, and information in a central location where others can find, view, and/or modify it. However, intranets include many additional features and benefits beyond those of traditional shared network folders. Just a few of these benefits include:

- The ability to search quickly through many documents to find the information you are looking for.
- The ability to hyperlink from one resource to related resources.
- The ability to navigate from one part of the "server" to another part more easily because of the navigation metaphors used on the Internet.
- The ability to actively push information to others instead of relying on others to pull down information from a shared server location.

Intranets show a great deal of promise for teams and departments. However, in most instances, the promise of an intranet has yet to become a reality. Microsoft wants to help you make an intranet a reality for your team or department.

The purpose of the Microsoft Office 97 Intranet Enhancements Guide is to

- Highlight new or improved features in Office 97
- Demonstrate the benefits these features provide to you or the person who uses Office 97 while creating an intranet.
- Demonstrate the benefits these features provide for everyone on a team or in a department who uses Office 97 to contribute to an intranet.

The following pages describe intranet features that are shared across the Office 97 suite, and highlight intranet-related features in Microsoft Word, Microsoft Excel, Microsoft PowerPoint, and Microsoft Access.

Overview of New Features in Microsoft Office 97

Office 97 seamlessly integrates Web technologies to make the promise of the Web relevant to today's businesses. Office 97 provides innovative tools for finding information, publishing documents, and collaborating interactively with others.

	Feature	Description
<i>New</i>	Integration with Internet Explorer	Users of Internet Explorer 3.0 or later can seamlessly browse Microsoft Office 97 documents.
<i>New</i>	Web Find Fast	Users can perform full-text searching of Office and HTML documents on a company network.
<i>New</i>	Hyperlinks	Users can connect Office documents with hyperlinks to other Office documents or sites on the Internet.
<i>New</i>	Web toolbar	A common toolbar provides standard browser functionality in all Office 97 applications so users can move easily between linked documents.
<i>New</i>	Opening from or Saving to a URL	Office 97 gives users the flexibility to open and then save files residing not only on the corporate network, but also on Web servers accessible through HTTP or FTP servers
<i>New</i>	Save as HTML	Microsoft Access, Microsoft Excel, Microsoft PowerPoint, and Microsoft Word now provide built-in support for viewing, creating, and saving files as HTML documents.
<i>Improved</i>	Office Viewers	Viewers allow users to view or print documents regardless of whether they have the Office application in which the document was created. Microsoft Excel, PowerPoint, and Word viewers are available at no cost directly from http://Microsoft.com/office/ .
<i>New</i>	Shared Files	Multiple users can work collaboratively on Microsoft Excel files at the same time.
<i>New</i>	In-place comments	Like electronic yellow sticky notes, comments can be added to a file in Word, Microsoft Excel or PowerPoint without altering the original text. Comments appear when users pause the mouse pointer over the commented text.
<i>Improved</i>	Change tracking	Word and Microsoft Excel automatically highlight, color-code, and identify changes made by other users, so multiple users can see what has changed in a document or worksheet.
<i>Improved</i>	Document merging	In Word or Microsoft Excel, users can easily

consolidate changes made to multiple copies of a document or worksheet back into the original. This allows users to share documents and worksheets even when they are not connected over a network.

New Features in Detail in Microsoft Office 97

Connectivity has become pervasive among software users. In fact, 65 percent of all computer users are now connected in some way—to an online service, an Internet service provider, or a public or private network. International Data Corporation research shows that 73 percent of corporations with 1,000 employees or more will have capabilities for an intranet by the end of 1996.

This connectivity has encouraged more users to collaborate and share information in documents online. Office 97 makes it easier to manage and exchange information with others and to connect documents to data on a network, an intranet, or the Internet.

Integration with Internet Explorer

Microsoft Office 97 integrates seamlessly with Microsoft Internet Explorer 3.0 or later to allow users to easily access, view and edit information contained in Office documents regardless of where it resides. With ActiveX Document Technology, Internet Explorer users who link to or open an Office document will view this information *inside* Internet Explorer, providing full access to all the tools of the Office application. This highly integrated solution eliminates the need for user to have multiple windows open on the desktop at one time.

Web Find Fast

Office 97 allows users to use the navigation and searching metaphors of the Web to quickly find what they are looking for. Find Fast technology allows full-text searching of both HTML and Office documents on a company network.

The user initiates a search by clicking the **Search** button on the **Web** toolbar or in a browser. After filling in the search criteria such as title, author, or other standard Office properties, the user clicks **Search**. The results are returned in an HTML page with hyperlinks to each of the found documents. Find Fast technology supports several search types and indexing characteristics.

Search option	Description
Full-text searching	The full text of every document is indexed and searchable.
Phrase searching	Find Fast looks for phrases such as <i>Business Plan</i> or <i>John Doe</i> .
Proximity searching	Find Fast looks for words that occur within a certain distance; for example, the search text <i>Plan NEAR Catalog</i> finds <i>Proposed Plan</i>

	<i>for Online Catalog.</i>
Property searching	Properties, such as author and title, are indexed and searchable.
Multiple volume indexing	Documents can reside on multiple file servers, so a user does not have to move documents to index them.
Relevancy ranking	Results are returned sorted by relevance; in other words, documents that most likely pertain to the query are listed first.
Centralized index	The index is stored centrally for greater simplicity and better performance.

Hyperlinks

Hyperlinks between documents make it easier for the reader (or author) to go to related information. For example, the specification for a new bicycle might include hyperlinks to the descriptions of individual parts that make up the bicycle.

Office 97 includes a simple dialog box that is shared across all Office applications to make it easy for any user to create and edit hyperlinks. These hyperlinks can go virtually anywhere — to other Office documents, HTML files, or any file with a recognized address — through a fully qualified path using a URL, UNC, or FTP address. Office 97 users can attach a hyperlink to a variety of objects, including text, graphics, objects, tables, presentation slides, worksheet cells, and custom database form fields.

Web Toolbar

To make it easier for users to use hyperlinks to move between documents, the **Web** toolbar is shared by Microsoft Access 97, Microsoft Excel 97, PowerPoint 97, and Word 97. The **Web** toolbar is similar to the navigation tools found in standard Web browsers, with common buttons for going forward, back, and to the home page. The **Search** button lets users do full-content index searching. A drop-down list box allows users to enter a URL or file location, and tracks the most recently visited sites.

Similar to the toolbar in Microsoft Internet Explorer, the **Web** toolbar has a Favorites list for easy access to the most often visited sites. With the **Web** toolbar, users also have one-click access to create hyperlinks, and a single button that optimizes the screen for online document viewing.

Opening from or Saving to a URL

Office 97 gives users the flexibility to open files residing not only on the corporate network, but also on Web servers accessible through HTTP or FTP servers. In addition, once users have created Office documents, they can save them to URLs using the **Save** command (**File** menu).

Online Publishing

Working effectively in a connected environment means that users must be able to publish information online as easily as they now print and save documents. Office 97 extends familiar ways of publishing information to the online environment in several ways.

Save as HTML

Microsoft Office is designed to provide the flexibility to publish information in a variety of formats. Every Office 97 application provides built-in support for viewing and creating HTML. Now, users can create rich content for the Internet or an intranet using the tools they are most familiar with.

Microsoft Office Viewers

To make it easy for all users to navigate to and share Office documents, Microsoft provides (or will provide) free file viewers for Microsoft Word 97, Microsoft Excel 97 and PowerPoint 97. These viewers enable users to view and print Office documents without requiring the applications to be installed. They also expose certain application features like document views in Microsoft Word, or AutoFilter in Microsoft Excel. Office viewers will be available for 16-bit Windows, 32-bit Windows, and the Macintosh (PowerPC only).

In-Place Comments

When users review printed versions of documents, they often fill the margins with comments. Similarly, users reviewing documents online want to write comments. With Microsoft Excel 97, Word 97, and PowerPoint 97 users can write and read comments when reviewing documents online.

Change Tracking

Each comment can now be read in context and includes the full name of the reviewer; light yellow shading indicates that there are comments present in the text. To display a comment, the user pauses the mouse pointer over the text or clicks the **Next Comment** button on the **Reviewing** toolbar.

Word 2.0 introduced revision marking to support online review and tracking of changes. In Word 97, Microsoft made further enhancements to revision marks and also changed the feature name to Track Changes to facilitate discovery, and to more closely match the way users talk about editing documents. ScreenTips tell users the date, time, and type of changes made; they appear when users pause the mouse pointer over changed text.

Document Merging

Word 97 and Microsoft Excel 97 allow users to consolidate all changes or rewrites from different authors in one easy step. Instead of having to manually merge documents or worksheets by copying and pasting changes across several versions, users can choose multiple files and seamlessly merge the changes back to the original. Word 97 and Microsoft Excel 97 track and merge not only information changes, but also formatting changes.

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APPENDIX H. MICROSOFT ACCESS97 KEY FEATURES

Microsoft Access 97 (Access)

One of the benefits of a local intranet is that it gives users the ability to find up-to-date information quickly. One way this is accomplished is by using search technology to find information stored in HTML pages, Word documents, Excel workbooks, PowerPoint presentations, and more. Another way this is accomplished is by giving users the ability to query a database from their desktop using a browser. Assuming the database is up-to-date, this ensures that the user gets real-time information upon which to make decisions, draw conclusions, etc.

Microsoft Access 97 makes it easy to create Web-based queries that allow users to pull real-time database information using a browser on their desktop. In addition, Access 97 includes additional features that bring database information and the Web closer together without complicated programming.

Overview of New Features in Microsoft Access 97

	Feature	Description
<i>New</i>	Hyperlinks	Users can store hyperlinks in all Microsoft Access databases to connect easily to information no matter where it resides.
<i>New</i>	Save to HTML	Users can publish static views of their data for a workgroup or on the Web.
<i>New</i>	Publish to the Web Wizard	This wizard automates the publishing of database information to the Web dynamically.
<i>New</i>	HTML importing, exporting and linking	Users can now import or attach their databases to HTML pages and use this information inside their Microsoft Access applications.
<i>New</i>	Internet replication	Users can extend the replication capabilities introduced in Microsoft Access 95 over the Internet using file transfer protocol (FTP).
<i>New</i>	Connecting to a database over an intranet	Microsoft Access 97 allows users to link tables residing in the most popular database formats not only via a local or remote access network connection; but via an Internet connection as well.

New Features in Detail in Microsoft Access 97

Hyperlinks

Microsoft Access 97 has integrated hyperlinks throughout the application.

Hyperlink Datatype

Microsoft Access 97 is one of the first desktop databases to support the storage of hyperlinks as a native datatype. The ability to store hyperlinks in a database adds many benefits. For example, an applicant's name stored in a job candidate database can become a permanent hyperlink to the candidate's resume. A supplier's name in a database of product offerings can become a hyperlink to that supplier's Web site. Both of these scenarios give the consumer the option to explore further, without requiring the owner of the data to do any additional work, except to create the hyperlink.

The ability of Microsoft Access 97 to help users organize and manage data further enhances the value that stored hyperlinks provide. Databases provide the structure in which to store related pieces of information and the tools to find and manage that data easily. But gathering and entering all the pertinent data can be an arduous task.

Combining the powerful organizational ability of Microsoft Access 97 with the low-maintenance data collection mechanism that hyperlinks offer makes for the best of both worlds. Hyperlinks provide an easy-to-locate single-click access to relevant data, requiring only minimal data entry.

Supporting hyperlinks as a native datatype has further implications for databases created in Microsoft Access 97. Command buttons with hyperlink properties can now connect as easily to an external Web site as they do to other Microsoft Access forms in previous versions. Labels and images can serve as navigation controls to sources both inside and outside the database itself.

Hyperlinks in Office Documents

Microsoft Access supports hyperlinks that go to URLs as well as to locations in other Office 97 documents.

Hyperlinks also allow connectivity between various objects within a Microsoft Access 97 database. Entire databases can be built using hyperlinks as the mechanism to connect objects. This method alleviates the necessity to create and then execute Visual Basic for Applications code, as was previously required, offering users an added performance benefit.

Save to HTML

In April 1996, Microsoft introduced the Internet Assistant for Microsoft Access 95. This add-on was the beginning of the integration between Microsoft Access and the Web, and made Microsoft Access the first desktop database product to natively support output of static data to HTML. In Microsoft Access 97 this functionality has been integrated directly into the product. Users can share static views of their data on the Web by clicking the **Save As HTML/Web Formats** command on the **File** menu.

Microsoft Access outputs table, query, and form datasheets as well as formatted reports directly to HTML. All output in Microsoft Access 97 makes use of the latest HTML specification. The formatting options employed are identical to those chosen for the object inside Microsoft Access 97. Datasheet font, color, and size are maintained, along with datasheet cell background color and sizing.

When outputting reports, Microsoft Access recognizes that reports may consist of more than one page and creates multiple pages of output connected by hyperlinks, allowing the viewer to see the report on the Web as it was originally intended. Hyperlinks stored in a database remain intact during the output process.

Output to IDC/HTX

The output of static data from a database is extremely useful, especially when the information seldom changes. However, today's users are interested in more than that; they need to publish information from a dynamic data source, so that users can return to the same location and always receive the latest information.

Leveraging the Internet Database Connector functionality that is native to Microsoft Internet Information Server and Microsoft Personal Web Server, Microsoft Access 97 provides an easy way for users to share their structured data in a workgroup or over the Internet.

Users select the objects they want to publish and provide a few basic pieces of information, and Microsoft Access 97 does the rest. In seconds, Microsoft Access creates the query files (ICD files) containing information about the view of data to publish, and the templates (HTX files) that contain information about how to format the information that is returned.

Parameterized Queries

Parameterized queries created in Microsoft Access 97 can also be published. This type of query requires the user to specify the criteria that is used in selecting the appropriate set of records. Extending this paradigm to the Web presents a datasource that is not only dynamic, but also interactive. Any user can request only the information relevant to them, and be assured that they will receive the most current response to their query.

The ability to publish dynamic database information easily on the Web allows all users to share information regardless of their proximity. Information that was previously restricted to a local machine or the corporate LAN can be shared with users around the globe or down the hall.

Publish to the Web Wizard

The new integrated Web technologies found in Microsoft Access 97 empower users by removing the remaining barriers that separate them from the information they need. The Publish to the Web Wizard provides a tool that automates that publishing process even more.

The Publish to the Web Wizard allows users to publish any object in their database either statically or dynamically. It allows for custom HTML formatting using templates, and retains all of the settings used to output the objects in the form of a configuration.

Users might choose to output some objects statically and some dynamically or choose a different template for every object in the database. The Publish to the Web Wizard integrates with the Microsoft WebPost Wizard to automatically move the published objects to the selected Web server on the Internet or corporate intranet.

Simplifying complex tasks has been a defining trait of Microsoft Access. Extending that capability to the world of database Web solutions means that millions of users will be able to instantly combine the power of a database with the accessibility of the Web, to obtain the best of both worlds.

Templates

To achieve the rich formatting that is the hallmark of most HTML documents, the Publish to the Web Wizard uses templates. A template is an HTML document that contains formatting attributes, images, and other elements that are applied the document being output. Using a pre-designed template, users can define what the output will look like in a WYSIWIG fashion and reuse their design later. Any data residing in a Microsoft Access 97 database can be formatted with the corporate image or other graphics elements.

HTML Importing and Linking

Most users of Microsoft Access initially import their information from another format: a Microsoft Excel spreadsheet, a delimited text file, or a client/server database such as a Microsoft SQL server. The recent emergence of HTML for distributing data has led to improvements in the Import/Export Wizard. In Microsoft Access 97, not only does the wizard read and import delimited and fixed-width text files, but it also imports data from HTML tables.

Users can point to an HTML document containing a table of data; the Import/Export Wizard reads the information and either imports it directly into a new table or appends the records to an existing table. If there are multiple HTML tables or lists on a single page, Microsoft Access 97 allows users to select the appropriate table to import. Once the data is imported, it becomes native Microsoft Access data just as if it had been entered through the Microsoft Access user interface.

Linking to HTML Tables

Typically, information residing on an HTML page changes regularly, but importing the information from the HTML page over and over again is not the most efficient way to get that information into Microsoft Access for further analysis. For that reason, Microsoft Access 97 allows users to link to an HTML table on any Web page. This read-only link makes it easy for users to incorporate the rich data from the Web into their existing Microsoft Access applications

APPENDIX I. MICROSOFT WORD97 KEY FEATURES

Overview of New Features in Microsoft Word 97

	Feature	Description
<i>New</i>	Online layout view	A new view optimized for on-screen reading makes it easier to read documents online.
<i>New</i>	Document Map	A split screen displays a hyperlink outline of the document in the left pane, and the text of the document in the right pane. This allows users to navigate and organize documents more easily.
<i>Improved</i>	Web page authoring	Users can automatically convert Word documents to HTML for easy posting to the Web or an intranet. Word 97 supports true WYSIWYG editing of HTML features such as backgrounds and marquee text, which allows users to preview their documents without switching to the browser.
<i>New</i>	Animated text	Text comes alive with effects that blink, march, shimmer, or sparkle
<i>New</i>	Background picture rendering	Users experience optimal online browsing with pictures rendered in the background. This allows users to browse through text without waiting for the entire document to be downloaded.
<i>New</i>	Compressed graphics	All pictures and graphics inserted into documents are compressed automatically, making file sizes smaller.
<i>New</i>	Web Page Wizard	Using the Web Page Wizard, users select the type and style of Web page they want and create the Web page more quickly.
<i>New</i>	Online content	The Microsoft site on the Web makes more clip art and templates available to users.
<i>New</i>	Support for HTML tags	Word 97 supports more than 80 HTML tags.

Detailed Description of New Features in Microsoft Word 97 (Word)

Online Layout View

Word 97 provides a new online layout view that is optimized for on-screen reading. What works best for reading printed pages is often different from what is best for reading online. For example, it is useful to see recurring headers and footers in printed output, but

not as useful online. Online layout view provides the best on-screen display of documents.

Research shows that optimal width for legibility online is approximately 60 to 70 characters per line. Online layout view restricts column width to display an average of 66 characters per line. A fixed column width also aids online authoring because it guarantees a constant line width across various displays and operating systems.

Typically, font size is optimized for printed output and is too small to read comfortably on the screen. In online layout view, fonts are scaled to be at least 12 points to make documents more readable online.

Online layout view also lays out pages based on a new virtual page size that is in turn based on the document window size. The page is designed to preserve 66 characters per line at the best font size. Page breaks are not indicated on the screen, but Word creates constant width margins to make the online page easy to read.

Document Map

The Document Map in Word 97 allows users to move around documents more easily. A split screen displays a hyperlink outline of a document in the left pane and the document text in the right pane. The Document Map gives users one-click access to points of interest, and serves as a "you are here" road map.

Navigation Tools

Word 97 combines the intuitive navigation of the scroll bar with the power of the **Find** and **Go To** dialog boxes. Microsoft usability tests show that users are comfortable navigating through their documents using the scroll bar, but the scroll bar is not the best tool when users are reviewing long, structured documents.

Word 97 contains a Document Browser accessible from the scroll bar. The browser lets users choose an element by which to navigate. For example, to review all the tables in a document, a user clicks the **Browse by Table** button in the browser. When the user clicks the **Previous** or **Next** button on the scroll bar, Word automatically goes to the previous or next table in the document. Users can browse by page, section, comments, footnote, endnote, field, table, picture, or headings.

Web Page Authoring

In Word 97, the Internet Assistant is built directly into the product. In addition, Word 97 extends Internet Assistant functionality to allow users to create sophisticated and powerful Web pages without having to learn HTML. Word 97 supports the following HTML tags:

- **Backgrounds** Users can create visually appealing and compelling documents using new background colors and textures. They can choose from two dozen built-in textures or create custom textures using Office Art.
- **Bullets** Users can create graphically rich bullets designed specifically for HTML documents.

- **Horizontal lines or rules** Word 97 extends its built-in borders and shading functionality to create colorful and graphical horizontal lines designed for HTML documents. A new **Horizontal Line** dialog box, accessible from the **Insert** menu, allows users to choose from a variety of colorful horizontal line images. A new toolbar button on the formatting toolbar gives users quick access to the last-selected line style.

Pictures Users can insert pictures in a Web page using the same **Picture** dialog box that is used with a standard Word document. Word 97 allows graphics to be hyperlinks, and automatically converts and compresses graphics and objects to JPEG or GIF images.

Video Users can use the Word **Picture** dialog box to add video clips and to decide when and how long a video clip will play.

Sound Word 97 gives Web page authors a background sound control so users can specify the sound file and the number of times to play it.

- **Marquee text** Marquee text allows users to create a banner of text that scrolls across the screen. The user controls all the animation, direction, speed, background color, and size of text.
- **Blinking text** Blinking, another popular text-animation effect, can be added to Web pages on the **Animation** tab in the **Font** dialog box (**Format** menu).
- **HTML forms** Word 97 provides a consistent approach to forms design regardless of whether users are creating forms in a standard Word document or an HTML document. The following form types and buttons are available:
- Check box, Password control, Radio button, Text box, List box, Select drop down, Select text area, Control Submit button, Image Submit button, Reset button

Animated Text

Animated text helps make documents come alive. With animated text, users can make their text blink, march, shimmer, or sparkle. Text animation is only for online use and is not visible in printed documents

Background Picture Rendering

Word 97 provides an optimal online browsing experience by rendering pictures in the background. This allows users to browse through text and other document elements without waiting for the entire document to download.

Compressed Graphics

Word 97 now automatically compresses pictures and graphics inserted into documents. In addition, Word natively stores JPEG images and converts all raster formats to PNG, a new compressed format.

Web Page Wizard

To get users up and running quickly, Word 97 includes a Web Page Wizard that allows users to select the type and style of the page they want to create. The Web Page Wizard provides users with content and design help so that they can successfully create a visually compelling page that effectively communicates the information they want to share.

Web templates exist for common types of Web pages, such as a personal home page, an information-request page, and a forms-based page (for example, a merchandising page). Word 97 also includes eight predefined styles that users can choose from when creating Web pages.

Online Content

In addition to the built-in collection of Web-specific elements, users of Word 97 have access to the Microsoft Web site to choose from a larger collection of Web-authoring templates, images, and tools.

- **Online Clip Art collection** New backgrounds, bullets, buttons, icons, horizontal lines, video files, and sounds will be posted on the Microsoft Web site for users to download.
- **Online templates** New Web templates created by Microsoft will be posted on the Web site for users to download.

Support for HTML Tags

Word 97 provides WYSIWYG support for authoring Web pages with commonly used tags such as tables, fonts, graphics, blinking text, and background sound. Word 97 supports more than 80 HTML tags. The supported tag set is updated on an ongoing basis, and Word automatically prompts the user to download support for new tags using the AutoUpdate feature.

APPENDIX J. MICROSOFT EXCEL97 KEY FEATURES

Microsoft Excel 97 (Excel)

Computer users of all levels are increasingly working together and exchanging information over local networks, intranets, and the World Wide Web. Microsoft Excel 97 streamlines and simplifies core spreadsheet tools to make them more accessible to a wider range of users and implements new technologies that allow users to take advantage of the increasingly connected computing environment.

For example, Microsoft Excel 97 makes it easy to save data and charts as HTML files or as HTML tables that can be inserted into existing HTML pages. As a result, users wanting to share financial, statistical, or other numerical data or graphs over an intranet can do so in a few simple steps using the Microsoft Excel Internet Assistant Wizard. In addition, users can save Excel workbooks to an intranet in their native Excel file formats so that their coworkers can open and collaborate on the workbook. Users can even set up Web queries which will pull information off of the intranet or the global Internet and include that information in the Excel workbook.

Overview of New Features in Microsoft Excel 97

	Feature	Description
<i>New</i>	Web Form Wizard	The wizard guides users through the process of connecting a Microsoft Excel form to a Web server so that administrators on different operating systems can use the information.
<i>New</i>	Support for HTML tags/Microsoft Excel 97 HTML tags	New HTML extensions enable PivotTables, AutoFilter, formulas, and spreadsheet formatting in HTML tables. When viewed by incompatible browsers, these tags revert to normal HTML tables, allowing users to view the underlying data. Inside Microsoft Excel 97, the tags are interpreted for added active functionality.
<i>New</i>	URLs in formulas	To connect to important data on a spreadsheet residing on a Web server, users can include URLs in formulas. This provides the fastest, easiest way to get the most up-to-date data on a worksheet, no matter where the data resides.
<i>New</i>	Web Queries	Users can import rich, dynamic, tabular data such as stock quotes, currency exchange, and weather information from the Internet into a spreadsheet. The data can be imported directly into formulas or charts and can be refreshed to keep it up to date.

New Features in Detail in Microsoft Excel 97

Web Form Wizard

Today, many Web pages use forms to collect user information. For most spreadsheet users, creating an online form and retrieving the information is difficult because it requires complicated HTML code; and submitting information to a Web server is no easier.

With the Web Form Wizard, Microsoft Excel 97 makes it easy for users to submit information from a form created in Microsoft Excel directly to a Web server. Once on the Web server, administrators can retrieve the information regardless of their operating system. Users now have an easy way to submit expense reports, time cards, and similar forms to a Web server.

Support for HTML Tags

Microsoft Excel 97 introduces new HTML tags for spreadsheet formatting, formulas, AutoFilters, and PivotTables to bring Microsoft Excel functionality to HTML documents. Users viewing these tags in incompatible browsers see the underlying data in a simple HTML table. When opened in Microsoft Excel 97, however, these tags are interpreted and bring an added layer of functionality.

URLs in Formulas

Microsoft Excel makes it easy to connect to important data no matter where it resides. Microsoft Excel users can create formulas with links to a range of cells in a separate workbook. This workbook can reside either on a desktop or on a corporate network. Now Microsoft Excel extends this capability to a workbook located on a Web server, so users can specify URLs in their formulas.

Web Queries

Much of the data available on the Internet, such as financial data, weather forecasts, and sports information, is dynamic and changes frequently. As more data becomes available online, there will be an increasing need for direct access to this data.

In Microsoft Excel 97, Internet data can be retrieved by running queries that import specified data into a spreadsheet on a regular basis. In addition, the imported data can be updated regularly on the same worksheet and used for calculations or in analysis.

APPENDIX K. MICROSOFT POWERPOINT97 KEY FEATURES

Microsoft PowerPoint 97 (PowerPoint)

In the "old days" of computer-based presentations (that is, six months to one year ago), the presenter would stand up at the front of a conference room and click through slides created in Microsoft PowerPoint. Afterward, the presenter might distribute hard copies of the presentation or copy the presentation to a shared network folder. Though many presentations are still given the old-fashioned way, many presentations today are actually given online.

Microsoft PowerPoint 97 makes giving presentations over an intranet or the Internet a reality. Using the Save As HTML Wizard, presenters can save their presentations as HTML pages with universal navigation bars so that the virtual audience can move logically through the presentation. In addition, Microsoft PowerPoint 97 makes it easy to import HTML information from the intranet while creating a presentation, gives users the ability to save their presentations to the intranet in native PowerPoint presentation file format, and much more.

Overview of New Features in PowerPoint 97

	Feature	Description
<i>New</i>	Slide Finder	Users can save time locating, integrating, and collecting existing slides for a new presentation from a corporate network. Slide Finder allows users to preview slides from existing presentations and import only those they want to use.
<i>Improved</i>	Every type of output	PowerPoint 97 provides users with every output option: slides, black-and-white and color overheads, black-and white and color handouts, speaker's notes, and on-screen electronic presentations. In addition, PowerPoint now supports virtual presentations over the Internet.
<i>Improved</i>	Intranet/Internet Viewer	Users can save presentations directly to an http or ftp server, and freely distribute PowerPoint Viewers on their servers to allow those who don't have PowerPoint to view presentations. The improved PowerPoint Viewer for Windows 95 supports password protection for kiosks and hyperlinks to other slides and to URLs on the World Wide Web.
<i>New</i>	Home page template	Users can quickly create personalized Internet or intranet home pages in PowerPoint using the

		AutoContent Wizard.
<i>Improved</i>	Presentation conferencing	Users can deliver presentations to remote users over Windows NT® Server-based networks, corporate intranets, or the Internet.
<i>New</i>	Save as PowerPoint Show	Presentation files can be set to start directly in slide show view when activated, skipping slide view.
<i>New</i>	Browse mode	Users can add a simple user interface to an electronic slide show before distributing it to others. Browse mode makes electronic presentations easier to navigate and control, particularly for inexperienced users.
<i>New</i>	Save as Web Animation	PowerPoint provides an easy way to create and publish "live" animations and presentations for more interesting and interactive Web pages.

New Features in Detail in PowerPoint 97

The following sections contain detailed descriptions of each feature, as well as screen shots of menus and some examples of output.

Slide Finder

The number one request from the PowerPoint Wish Line is the ability for users to quickly find and reuse slides from existing presentations without browsing vast corporate servers. In fact, Microsoft usability research shows that 32 percent of presentation builders reuse slides from existing presentations. Users can use the new Slide Finder to instantly preview and open PowerPoint files by keeping frequently used presentations in the list of favorites. In addition, it allows users to easily browse slides in others' presentations, and insert specific or entire sets of slides from these existing presentations.

Every Type of Output

PowerPoint 97 provides users with every type of traditional presentation output option users still need to be able to produce slides, black and white and color overhead slides and handouts, speaker's notes, and on-screen electronic presentations in meetings and kiosks. In addition, PowerPoint now supports users who want to deliver virtual presentations over the Internet.

Intranet/Internet Viewer

Users can save presentations directly to an http or ftp server and freely distribute PowerPoint Viewers on their servers to allow those who don't have PowerPoint to view presentations. The improved PowerPoint Viewer for Windows 95 supports password protection for delivering presentations in kiosks, and supports hyperlinks to URLs on an intranet or the Internet.

Home Page Template

Users can use the Home Page option in the enhanced AutoContent Wizard to step through everything they need to do to create a personalized home page, complete with image maps and links with URLs of their favorite Web sites.

Presentation Conferencing

Anyone who has been in a meeting via a conference call knows that visual aids could make those meetings much more effective. PowerPoint 97 lets users deliver their presentations over Windows NT-based networks, and now over the Internet. The Presentation Conference Wizard walks the presenter through setting up the connection to his or her audience, no matter where the audience is located — across town, in another city, or another country.

Save as PowerPoint Show

One of the most commonly requested improvements to PowerPoint was the ability to set presentations to launch directly into Slide Show when activated, instead of launching into Slide View. PowerPoint 97 makes this possible with the new .pps file format, which is now supported and available in the PowerPoint 97 Save As dialog box. Used with Office Web, presentations can be set to launch into Slide Show (including the Browse and Kiosk Mode variants) when selected from within another Active Document, allowing for a greater degree of electronic delivery control on a corporate intranet.

Browse Mode

Users of PowerPoint are increasingly interested in presenter-less presentations, where the recipient is expected to self-navigate through a presentation in the absence of a presenter. Tools such as Pack and Go, Sound Narration and Save as HTML Wizard facilitate this kind of use. Historically, one of the largest barriers to effective use of PowerPoint for unattended presentations was the lack of an interface during Slide Show. Recipients not familiar with PowerPoint often had no idea how to advance the slides in a presentation, or otherwise navigate the slides. Setting a slide show to be browsed by an individual invokes a new variant of on-screen presentation called Browse Mode, where PowerPoint provides a small menu-driven interface for navigating slides in an electronic presentation. The result is a much more comfortable experience for the recipient of the PowerPoint presenter-less communication.

Save as Web Animation

PowerPoint provides an easy way to create and publish "live" animations and presentations for more interesting and interactive Web pages.

Visitors view the special effects and presentations with the **PowerPoint Animation Player**, a free Internet browser extension that instantly runs PowerPoint animations or presentations in a window on an HTML page.

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APPENDIX L. NOVELL GROUPWISE KEY FEATURES

All information obtained from Novell GroupWise Help (Novell)

I. Sending Messages (Writing messages)

A. Determine Which Type of Message to Send

Every day you communicate in a variety of ways. GroupWise helps you deliver your messages by giving you a variety of message types. Each message type is explained below.

(1) Mail

A Mail message is for basic correspondence. You can use it for anything resembling a memorandum or letter.

(a) Include a File in a Message

Sharing information is common in a company. However, printing files uses a lot of time and paper if you need input from 20 co-workers in another building. With GroupWise you can attach the electronic file to a message and send it to other GroupWise users. The recipients can make changes and return the revised copy to you.

(2) Appointment

An Appointment lets you invite people to and schedule resources for meetings or events. You can schedule the date, time, and location for the meeting in the appointment. You can use personal appointments to schedule personal events like doctor's appointments, or a reminder to make a phone call at a certain time, and so forth.

(3) Task

A Task lets you place a to-do item on your own or another person's task list. You can schedule a due date for the task and include a priority (such as A1). Uncompleted tasks are carried forward to the next day.

(a) Put a Task on Someone's Task List

Task lets you add a to-do item directly to someone's personal task list. For example, if you have assigned someone to write a report that is due next week, you can put that task on the person's task list. The person has the option of accepting or declining the task, but until it is declined or completed, it is carried forward to the next day.

(b) Address the Task

Type the user ID(s) who will be responsible for this task. Include a brief description of the task in the Subject. Include more detailed information, if necessary, in the Message.

(c) Assign the Priority

Assign the task a priority such as 1, 2, 3, or A1, A2, B1, and so on.

(d) Schedule the Start and Due Dates

Type the date the user should begin working on the task. If the last field is Due In, type the length of the task, such as 4 days or 2 weeks. If the last field is Due On, type the date when the task should be completed.

(4) Note

A Note is a reminder that you post on a specific date on your calendar. You can use notes to remind yourself or others of deadlines, holidays, days off, and so forth. Personal notes are good as reminders for birthdays, anniversaries, vacations, and paydays.

A note works best as a reminder. It gives advanced warning (when the recipient first receives the note in his or her In Box), and a reminder (in the calendar on its scheduled date). Here are some suggestions.

- (a) Remind Someone of an Event
- (b) To remind yourself and others of paydays (you can schedule these with an auto-date formula)
- (c) To remind yourself and others of company holidays
- (d) To give advanced notice and reminders to your supervisor of your vacation days
- (e) To inform a workgroup of a deadline (you can also use a task for this)

(5) Phone Message

A Phone Message helps you inform someone of a phone call or visitor. You can include such information as caller, company, urgency of the call, and so forth.

B. Proofread a Message with GroupWise

(1) Spell Check

Spell Check looks for misspelled words, duplicate words, and irregular capitalization in the text of your message.

(2) Thesaurus

The Thesaurus displays synonyms or antonyms of words in your message.

(3) External word processor

You can type the contents of a message in another word processor, save the text, then retrieve it into the message box of an item you want to send.

2. Sending Messages (Delivering message)

A. Get Messages to the Right People

Addressing a message in GroupWise is fairly simple; all you need to do is type the person's user ID in the To box. If you don't know the user ID, you can look in the Address Book.

B. Make Urgent Messages Stand Out

Sometimes a message you send needs to be read immediately, but how do you let the recipient know that? You can change the priority of the message to high and GroupWise will let the recipient know that it is an urgent message by changing the icon in the In Box.

C. Keep My Messages Confidential

If you have a proxy who manages your mailbox, or you send messages to someone who has a proxy, you need to know how to keep either proxy from reading some of your correspondence. You can mark sensitive messages private to keep proxies from reading them.

D. Write a Message Now and Deliver it Later

You may want to have a message delivered on a specific date, but you don't want to wait until that day to send it. For example, you may be out of town on a colleague's birthday but want to give your best regards. The Delay Delivery feature lets you specify when you want the message sent.

E. Route a Message or File to Several People Consecutively

Some of your work may need to be edited or approved by several people in a specific order. Instead of collecting the comments on paper, you can attach your electronic file to a mail message or task and send it with a routing slip. The routing slip sends it to each person on the list in order. If you include yourself as the last recipient, you'll get the file back with all editing marks and comments included.

F. Make Sure Everyone Got My Message

Have you ever sent a message, then waited for a response that never came? How can you tell if the message ever made it? GroupWise lets you check the status of any item you sent and politely demand a response.

(a) Track a Message in the Out Box

You can check the status of any item you send by selecting the item in the Out Box, choosing Actions, then choosing Info. The Information window shows you when the message was delivered and opened.

(b) Receive Notification When the Message is Opened or Deleted

You can receive notification when the recipient opens or deletes a message, declines an appointment, or completes a task. While sending a message, choose Send, then choose Send Options. Choose when and how you want to receive notification with the Return Notification pop-up lists.

(c) Request a Reply

You can inform the recipient of a message that you need a reply. GroupWise adds a sentence to the message stating that a reply is requested and changes the icon in the recipient's mailbox to a double arrow. To request the reply while sending a message, choose the Send menu, then choose Send Options. Select how soon you want the reply in the Reply Requested box.

3. Read mail (Get mail)

A. Open mail

You have just received a message in GroupWise. What do you do next? You can read all types of new messages from the In Box. However, when it comes to appointments, tasks, and notes, you may want to read them from your calendar. This way, you can view the new messages while looking at your schedule.

B. Delete unwanted mail

When you don't need a message anymore, deleting it from the In Box or Out Box will reduce clutter. The deleted messages go to the Trash. You should also empty your Trash regularly to free hard disk space and increase mail efficiency.

C. Save mail

When you receive or send messages and attachments you want to keep for later use, you can save them. The messages and attachments in your Calendar, In Box, and Out Box can be saved as text files. You can read text files with GroupWise or a word processing application.

4. Read mail (Respond to mail)

A. Send a reply

You may want to make a suggestion or offer a comment to the author of a message you received. GroupWise lets you send a reply directly to the sender, as well as to everyone who received the original message, without having to create a new message. You can also include a copy of the original message in your reply.

B. Accept or Decline an Appointment, Note, or Task

In today's workplace, people and assignments make many demands on your time. When you receive an appointment, task, or note, you may or may not be able to oblige. In GroupWise, you can let the sender know if you accept or decline, and add additional comments. The sender can find your response by checking the item's Information window from the Out Box

D. Delegate an Appointment, Note, or Task

Sometimes you receive requests that you can't accept, or that someone could better handle. Instead of declining the request, you can delegate it. You can delegate appointments, tasks, notes, or routed items. The sender can find out who you delegated the request to and read any additional comments in the Information window from the Out Box.

E. Complete a Routing Slip

Some work may need to be edited or approved by several people. GroupWise lets you attach files to messages to be sent to different people in a specific order. Each person reads the message and makes comments or changes. This is a routing slip. You just received a routing slip. After completing your work, how do you send the message on its way?

F. Forward a Message

When you receive a message you want to share with other people without retyping it, or when the message applies more appropriately to someone else, you can forward the message.

5. Using Daily Planner (tracking own schedule)

A. Set alarms

Have you ever realized you are already two minutes late for a meeting and it will take you 10 minutes to get there? GroupWise can sound an alarm to remind you of your appointments and help you get there on time.

B. Schedule a personal appointment

You want to get away early Wednesday afternoon, but the way meetings happen, you know someone will try to schedule you. Just make sure you schedule a personal appointment beginning when you need to leave.

C. Make a To-do list

It's Monday and you have many things to do this week. You can enter each task on your task list and it will appear on the date it is due, listed in order of priority. If you don't get a task done one day, it is automatically carried over to the next day.

D. Write notes to self

You just had an important phone call and you want to record a few details as a permanent record. Enter the details in a personal note. Anytime you need the information, you can look back at that date and see the notes you made.

E. Look at a different date

You have the opportunity to attend a seminar away from the office if there are no scheduling conflicts. You can easily look at the date of the seminar to find out.

F. Look at several days

You have a busy week coming up with a lot of meetings. But you also have a report due by Friday. You need to look at your whole week to see if there is enough time or if you will need to rearrange your schedule.

G. Print your schedule

You are leaving the office and need to have a record of all your appointments, notes, and tasks. You can easily print a copy of your schedule.

6. Using Daily Planner (Scheduling meetings and appointments)

A. Schedule a Meeting or Appointment

What's the hardest thing about scheduling a meeting? Finding a free time? Remembering to schedule the right people? Making sure you have the right room and the overhead projector is available? GroupWise can handle all of these! Schedule the meeting using New Appointment in the Send menu. The following features solve your other problems.

(a) Personal Groups and Public Groups

Schedule the same people every time. Use Personal Groups to send a message to several users or resources by typing just the group name in the To, BC, or CC text boxes. A personal group is created and used by you. Use Public Groups to send a message to several users or resources by typing just the group name in the To, BC, or CC text boxes. A public group is created by the system administrator and is available for use by each user on the system.

(b) Busy Search

See if everyone (or at least most people) is available. Use Busy Search to determine if people and resources needed for an appointment are already busy. You are in charge of a committee meeting, but the members of the committee work in different departments. You know when you are free, but when are they? Busy Search will check their schedules and also see if the room and equipment you need are available. Busy Search is not available in Remote.

(c) Auto-Date

Schedule regular meetings in advance. Use Auto-Date to schedule recurring appointments, notes, and tasks. These can occur on the same day every week (for example, every Monday); the same day(s) of the month (for example, the 15th and last day); or any other defined series of dates. You can also use Auto-Date to schedule irregular or infrequent events, such as holidays. You are responsible for scheduling a department meeting the first and third Friday each month for the entire year. You need to schedule a room, always have a projector available, and schedule the entire department. You can create one appointment that will schedule the meeting for the entire year.

(e) Cancel or Reschedule a Meeting

You just realized you scheduled a meeting, you're in charge, and you can't be there. Don't worry. You can easily cancel the appointment for everyone you scheduled, even if they have already accepted it. You can also just change the time or date, and then resend the appointment.

(f) Resources

Resources include rooms, equipment, cars, or anything else the system administrator defines as a resource. When a resource is created, the system administrator gives it a name and assigns it to a user. The user who manages the resource (the owner) receives all requests for the resource and can accept or decline them. The owner of a resource has full proxy rights to the resource. Resources can be scheduled or included in a Busy Search just as individuals can. Resource IDs are entered in the To text box.

(g) Information

Find out who is coming. Use Information to view the status of any item in your In Box or Out Box. You can see if it has been delivered, opened, or accepted. You can also see names of other recipients, and more.

7. Take Care of Mail When I'm On Vacation

A. Overview

When you're away from your office, business can go on as usual. You can create Rules to handle your mail or you can give someone access to your mailbox so that person (your proxy) can manage your messages.

B. Forward My Mail (Rules)

A co-worker has agreed to handle your mail while you're away. You decide what type of incoming messages you want him or her to handle, and create a rule to forward those messages.

C. Reply Automatically (Rules)

If you have to be out of the office for several days, you can create a rule to send a reply to all incoming messages. In your reply, you can tell senders where you are, when you'll be back, and whom they should contact for urgent business.

D. Delegate Appointments, Notes, and Tasks (Rules)

If someone agrees to cover for you while you're away from the office, you can create a rule to delegate appointments, tasks, or notes to that person. Senders of the requests can find out whom you have delegated the item to from their information windows.

E. Give Someone Rights to Read My Mail (Access List)

Before someone can help you manage your mailbox while you're away, you need to give that person (your proxy) access rights to your mailbox

8. Using GroupWise when away

A. Send Mail Using Remote

You are attending a convention in another state; you need to keep in touch with the main office. While you are away, you can communicate with your co-workers at the office by sending messages.

B. Get Mail from My Master Mailbox

Work doesn't stop just because you are away from the office. While you are away, you can receive correspondence from your co-workers. You can get your mail by specifying the type of mail you want, then connecting to your master GroupWise system. For example, sometimes you may want to download only mail messages. Another time, to save telephone charges, you may want to download only the subject lines of all types of mail, then later determine whether you want the entire message.

C. Synchronize My Mailboxes

You may want to synchronize your Remote and master mailboxes so when you return to your office, your master mailbox reflects the changes you made while you were away. For example, if you create a new rule on your Remote system, you may also want the new rule to appear in your master system.

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APPENDIX M. DOD PUBLICLY ACCESSED WEB SITE POLICY

Office of the Secretary of Defense
Policy for
ESTABLISHING AND MAINTAINING A PUBLICLY ACCESSIBLE
DEPARTMENT OF DEFENSE WEB INFORMATION SERVICE

July 18, 1997

Updated January 9, 1998

References:

- (a) 5 USC Chapter 35, "Paperwork Reduction Act", as amended
- (b) Government Printing and Binding Regulations, Joint Committee on Printing, Congress, US, February 1990, No. 26
- (c) National Archives and Records Administration General Schedule 20, August 1995
- (d) Deputy Secretary of Defense Policy Memorandum, Government Information Locator Service (GILS), 2 September 1995
- (e) Memo from the Chairman, Joint Committee on Printing, granting waiver for Commercial Enterprise Newspapers, July 15, 1983
- (f) Office of Management and Budget (OMB) Bulletin 95-01, Establishment of Government Information Locator Service, 7 December 1994
- (g) DoD Directive 5040.5, Alteration of Official DoD Imagery, August 29, 1995, ATSD(PA)
- (h) DoD Directive 5230.9, Clearance of DoD Information for Public Release, April 9, 1996
- (i) DoD Directive 5400.7, DoD Freedom of Information Act Program, May 22, 1997, ASD(PA)
- (j) DoD Directive 5500.7-R, Joint Ethics Regulation (JER), August 30, 1993
- (k) DoD Directive 8910.1-M, DoD Procedures for Management of Information Requirements, June 11, 1993, ASD(C3I)
- (l) DoD Instruction 1015.10, Programs for Morale, Welfare, and Recreation (MWR), November 3, 1995, ASD (FMP) through Ch 1, October 31, 1996
- (m) DoD Instruction 5120.4, DoD Newspapers and Civilian Enterprise Publications, May 29, 1996, AFIS
- (n) DoD Instruction 5230.29, Security and Policy Review of DoD Information for Public Release, May 6, 1996, ASD(PA)
- (o) AR 60-20/AFR 147-14, Army and Air Force Exchange Service Operating Policies, 15 December 1992
- (p) DoD Directive 5240.1, DoD Intelligence Activities, April 25, 1988, ASD(C3I)

1. PURPOSE

This policy memorandum outlines policy related to establishing and maintaining publicly accessible web information services. It supersedes the "Guidelines for Establishing and Maintaining a Department of Defense Web Information Service" published by the Office of the Assistant Secretary of Defense (Public Affairs) on 28 December 1995.

2. APPLICABILITY

This policy applies to:

2.1. The Office of the Secretary of Defense (OSD), the Military Departments (including the Coast Guard when it is operated as a Military Service in the Navy), the Chairman of the Joint Chiefs of Staff, the Combatant Commands, the Defense Agencies, and the Department of Defense (DoD) Field Activities (hereafter referred to collectively as "the DoD Components").

2.2. Publicly accessible web information services and other publicly accessible services using the Internet.

3. DEFINITIONS

3.1. Internet. The loosely connected worldwide collection of computer systems that uses a common set of communications standards to send and receive electronic information.

3.2. World Wide Web or web. The subset of the Internet capable of providing the public with user-friendly graphics-based multi-media access to information on the Internet. It is the most popular means for storing and linking Internet-based information in all multi-media formats. Navigation is accomplished through a set of linked documents that may reside on the same computer or on computers located almost anywhere else in the world.

3.3. Web Information Service. A collection of web documents related to a common subject or set of subjects, including the "home page" and the linked subordinate information.

3.4. Web site. The physical location of the computer where web documents reside. This term is also commonly used to refer to a web information service.

3.5. Home page. The index or introductory document for a web information service.

3.6. DefenseLINK. The name of the official publicly accessible web information service for the Department of Defense (DoD). DefenseLINK provides the official single point of access to all DoD information on the World Wide Web, and establishes a means to ensure

that the information is readily accessible, properly cleared and released, accurate, consistent, appropriate and timely. When referencing DefenseLINK, the name should be shown exactly as indicated here, with small letters and CAPS. Graphic files of the logo are available by clicking on the Pentagon on the DefenseLINK home page.

3.7. Official DoD web information service. A DoD web information service that is developed and maintained with appropriated funds; and for which the DoD Component, or a subordinate organization, exercises editorial control over content. The content of official DoD web information services is of an official nature that may be endorsed as the official position of the DoD Component. Content may include official news releases, installation history, command position papers, etc. Official DoD web information services are prohibited from displaying sponsorships or commercial advertisements.

3.8. Unofficial DoD web information service. A DoD web information service that is developed and maintained with non-appropriated funds; and for which the DoD Component, or a subordinate organization, does not usually exercise editorial control over content. The content of unofficial DoD web information services is not endorsed as the official position of the DoD Component. Content will not normally include official news releases, installation history, command position papers, etc. Unofficial DoD web information services may include sponsorships and commercial advertisements, and may also advertise products for sale, in accordance with the mission of the organization. In most cases, unofficial DoD web information services are developed and maintained by commercial or nonprofit organizations. Certain military-affiliated organizations may develop and maintain unofficial DoD web information services. Such organizations include service exchanges and Morale, Welfare and Recreation activities that use non-appropriated funds.

4. POLICY

4.1. Management Responsibility. Consistent with other leadership responsibilities for public and internal communication; the decision whether or not to establish an organizational web information service, and to publish appropriate instructions and regulations for a web information service, is hereby delegated to each DoD Component. Heads of DoD Components may delegate this authority to lower levels, but shall ensure that all information placed on publicly accessible web information services is properly cleared and released. Detailed requirements for clearance of information for public release are located in DOD Instruction 5230.29 (reference (n)).

4.1.1. All DoD Components, or subordinate organizations, that establish publicly accessible web information services are responsible for ensuring that adequate procedures are in place and followed for:

management oversight and regular functional review of the service;

operational integrity and security of the computer and network supporting the service; validation of the accuracy, consistency, appropriateness, and timeliness of all information placed on the service; registration of the service with the Government Information Locator Service (GILS) funding, equipping, staffing and training necessary to develop and maintain the service

4.1.2. Each organization implementing a computer web site for their publicly accessible web information service shall establish a security certification and accreditation procedure. Successful implementation depends on defining security requirements early. All security-related disciplines (computer, communications, personnel, etc.) shall be considered in the requirements definition for the web service. Cost versus risk tradeoffs shall be evaluated and security requirements assigned accordingly.

4.2. Support of Mission. Each publicly accessible web information service shall have a clearly defined purpose that supports the mission of the DoD Component. The defined purpose and general content of the service shall be approved by the head of the DoD Component, or his/her designee in accordance with official policies. A publicly accessible web information service shall be limited only to information for which the DoD Component is directly responsible. Non-copyrighted material, text, clip art, images and sound or video clips may be used only if they relate to the Component's mission. Copyrighted material shall be used only in accordance with current copyright laws. In accordance with the Joint Ethics Regulation, product endorsements or preferential treatment shall NOT appear on any official DoD publicly accessible web information service.

4.3. Government Information Locator Service (GILS) Requirement. In accordance with OMB Bulletin 95-01 (reference (f)), and the Deputy Secretary of Defense policy memorandum (reference (d)), each publicly accessible web information service, major publication and major collection of information is required to be registered with GILS. GILS is designed to be an on-line "card catalog" designed to help the public access government information. Information about GILS requirements and instructions on how to receive the on-line submission form are available on DefenseLINK (<http://www.defenselink.mil/>), under "Search". The GILS registration process requires the name of the release authority as verification that the information has been properly cleared for public release. DoD Components are responsible for ensuring GILS registrations are completed. DoD Component web information services shall provide links to the web information services of subordinate organizations only if those web services have been registered with a completed GILS record.

4.4. Privacy and Security Notice. A privacy and security notice must be given to users of each publicly accessible web information service and shall be prominently displayed or announced on at least the first page of all major sections of each web information service. Providing a statement such as "Please read this privacy and security notice." linked to the

actual notice is satisfactory. Organizations shall avoid flashy graphics or other indicators that create a misperception of danger, such as skull-and-crossbones logos or "warning" signs. If the web site collects any information on usage or other log files, visitors shall be notified of what information is collected, why it is collected and how it is used. Agencies subject to DoD Directive 5240.1 (reference (p)) must comply with its provisions.

4.4.1. Text of Privacy and Security Notice

The following privacy and security notice may be tailored in the indicated areas by each organization sponsoring a publicly accessible web information service. The notice shall be approved by the appropriate local legal authority before use.

Link from Index.html pages -- "Please read this privacy and security notice."

() - indicates sections to be tailored at the installation level

[] - indicates hyperlinks

* - indicates information located at the hyperlink destination indicated

PRIVACY AND SECURITY NOTICE

1. (DefenseLINK) is provided as a public service by the ([Office of the Assistant Secretary of Defense-Public Affairs] and the [Defense Technical Information Center]).
2. Information presented on (DefenseLINK) is considered public information and may be distributed or copied. Use of appropriate byline/photo/image credits is requested.
3. For site management, [information is collected]* for statistical purposes. This government computer system uses software programs to create summary statistics, which are used for such purposes as assessing what information is of most and least interest, determining technical design specifications, and identifying system performance or problem areas.
4. For site security purposes and to ensure that this service remains available to all users, this government computer system employs software programs to monitor network traffic to identify unauthorized attempts to upload or change information, or otherwise cause damage.
5. Except for authorized law enforcement investigations, no other attempts are made to identify individual users or their usage habits. Raw data logs are used for no other purposes and are scheduled for regular destruction in accordance with [National Archives and Records Administration General Schedule 20].

Agencies subject to DoD Directive 5240.1 shall add the following to paragraph 5: "All data collection activities are in strict accordance with DoD Directive 5240.1 (reference (p))."

6. Unauthorized attempts to upload information or change information on this service are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and the National Information Infrastructure Protection Act.

7. If you have any questions or comments about the information presented here, please forward them to (us using the DefenseLINK [Comment Form]).

* Link from above - "information is collected" to the following text:

NOTE: The information below should be tailored, if necessary, to show an accurate example of the specific information being collected.

Example: Information Collected from (DefenseLINK) for Statistical Purposes

Below is an example of the information collected based on a standard request for a World Wide Web document:

xxx.yyy.com - - [28/Jan/1997:00:00:01 -0500] "GET /defenselink/news/nr012797.html HTTP/1.0" 200 16704 Mozilla 3.0/www.altavista.digital.com

xxx.yyy.com (or 123.123.23.12)-- this is the host name (or IP address) associated with the requester (you as the visitor). In this case, (....com) the requester is coming from a commercial address. Depending on the requester's method of network connection, the host name (or IP address) may or may not identify a specific computer. Connections via many Internet Service Providers assign different IP addresses for each session, so the host name identifies only the ISP. The host name (or IP address) will identify a specific computer if that computer has a fixed IP address.

[28/Jan/1997:00:00:01 -0500] -- this is the date and time of the request

"GET /defenselink/news/nr012797.html HTTP/1.0" -- this is the location of the requested file on (DefenseLINK)

200 -- this is the status code - 200 is OK - the request was filled

16704 -- this is the size of the requested file in bytes

Mozilla 3.0 -- this identifies the type of browser software used to access the page, which indicates what design parameters to use in constructing the pages

www.altavista.digital.com - this indicates the last site the person visited, which indicates how people find (DefenseLINK)

Requests for other types of documents use similar information. No other user-identifying information is collected.

4.5. External Links

4.5.1. Approval. The ability to hyperlink to sources external to your organization is a fundamental part of the World Wide Web, and can add significant value to the functionality of publicly accessible DoD web information services. It is advisable for DoD Components to establish objective and supportable criteria or guidelines for the selection and maintenance of links to external web pages.

4.5.1.1. Links to non-DoD web resources should support the organization's mission. External links should be reviewed periodically to ensure their continued suitability. If the content of a linked external site becomes questionable or objectionable, remove the link.

4.5.1.2. In accordance with DoD 5500.7-R (reference (j)), no product endorsements or preferential treatment shall be given on publicly accessible official DoD web information services.

4.5.1.3. No payment of any kind shall be accepted in exchange for a link placed on an organization's publicly accessible official DoD web information service.

4.5.1.4. In accordance with reference (j), DoD web information services shall not require or encourage users to choose any specific browser software. Only text or hyperlinked text shall be used to direct visitors to software download sites. Graphics or logos depicting companies/products shall not appear on DoD web information services.

4.5.1.5. Organizations considering the use of "frames" technology to connect to external sites should consult legal counsel concerning trademark and copyright issues before establishing such links.

4.5.1.6. Organizations are encouraged to link to authorized activities in support of the organization's mission, such as the Army and Air Force Exchange Service (AAFES, <http://www.aafes.com>), the Navy Exchange Service Command (NEXCOM, <http://www.navy-nex.com>) and the Marine Corps Exchange. If these sites contain

commercial advertisements or sponsorships, the appropriate disclaimer below shall be given.

4.5.1.7. When external links are included, the head of the DoD Component, or the subordinate organization, is responsible for ensuring that a disclaimer is made that neither the DoD nor the organization endorses the product or organization at the destination, nor does the DoD exercise any responsibility over the content at the destination. This includes credits given to contractors who produce DoD web information services.

4.5.1.8. Organizations must realize that once the decision is made to include a link to one non-DoD site, the organization may have to link to all similar sites.

4.5.2. Disclaimer for External Links. The disclaimer below shall be displayed when linking to external sites. This disclaimer may appear on the page or pages listing external links, or through an intermediate "exit notice" page generated by the server machine whenever a request is made for any site outside of the official DoD web information service (usually the .mil domain). An example of such an exit notice is located at the White House WWW site at <http://www.whitehouse.gov/>.

"The appearance of this hyperlink does not constitute endorsement by the (Department of Defense/the U.S. Army/the U.S. Navy/the U.S. Air Force/the U.S. Marine Corps, etc.) of this web site or the information, products or services contained therein. For other than authorized activities such as military exchanges and Morale, Welfare and Recreation sites, the (Department of Defense/the U.S. Army/the U.S. Navy/the U.S. Air Force/the U.S. Marine Corps, etc.) does not exercise any editorial control over the information you may find at this location. This link is provided consistent with the stated purpose of this DoD web site."

4.5.3. DoD Newspapers. The policies and procedures in DoD Instruction 5120.4 (reference (m)) apply to all DoD newspapers and civilian enterprise publications, whether printed or electronic.

4.5.3.1. DoD funded newspapers and editorial content of civilian enterprise publications may be posted on DoD web sites without advertising. Commanders and heads of organizations are authorized to link to a commercial/civilian web site carrying the authorized civilian enterprise publications, which include advertising, provided the standard disclaimer for external links is given.

4.5.3.2. This policy information will be included in the next revision of DoD Instruction 5120.4. Any questions concerning this policy may be addressed to the American Forces Information Service, Print Media Plans and Policy section, (703) 428-0628.

4.6. Image Manipulation Standards. Official DoD imagery provided on publicly accessible DoD web information services must conform to DoD Directive 5040.5 (reference (g)).

4.7. Restricted Access. No information which is withholdable from the public pursuant to statute, or intended for restricted access or limited distribution, may be placed on a publicly accessible web information service. Nor should a public site have links to such information. This prohibition includes information that is classified, unclassified but sensitive, for official use only (FOUO), and privacy protected. Information cleared for public release under the Freedom of Information Act may be posted on publicly accessible web information services.

4.8. Commercial Sponsorship and Advertising. Commercial sponsorships, advertisements and endorsements are prohibited on publicly accessible pages of official DoD web information services. Publicly accessible web information services are official communications to the public. Just as the DoD would not print advertisements on news releases, the Department shall not post advertisements on publicly accessible official DoD web information services. Organizations shall ensure that the credibility of official information is not adversely affected by association with commercial sponsorships, advertisements or endorsements.

4.8.1. Non-appropriated Fund Activities and Web Information Services.

In accordance with DoD Instruction 1015.10 (reference (l)). MWR programs may have commercial sponsors and may sell electronic advertising as outlined in that instruction. As the instruction points out, MWR products with advertisements are intended for distribution to the DoD internal audience authorized to take advantage of these programs.

4.8.1.1. However, having advertisements on pages that are part of an official, publicly accessible DoD web information service is inappropriate. Organizations are encouraged to include official information about non-appropriated fund (NAF) activities on official DoD web sites as long as the information does not include commercial sponsorships or advertisements.

4.8.1.2. With organization approval, NAF activities may use non-appropriated funds to develop and maintain commercial web sites for unofficial information, where commercial sponsorship or advertising may appear. External links to authorized, unofficial NAF commercial web sites are authorized, with an appropriate disclaimer preceding the actual connection to the NAF commercial web site to avoid product endorsement or preferential treatment.

4.8.1.3. Official information pertaining to the NAF activity may be posted on the commercial non-appropriated fund web site with installation commander/organization

head approval, but only if it is also posted on the official publicly accessible DoD web information service. Other official information shall not be posted to the commercial site.

4.9. Design Standards and Non-standard Features (ActiveX and Java)

4.9.1. Design of publicly accessible web information service documents should conform to the current Hypertext Markup Language standards from the World Wide Web Consortium. Use of other non-standard or browser-specific features may mean a portion of visitors cannot access certain information.

Updated as of January 9, 1998: The latest Hypertext Markup Language specification from the World Wide Web Consortium is located on their site under Technical Reports -> Recommendations at <http://www.w3.org/TR/#Recommendations>.

4.9.2. Incorporation of non-standard or browser-specific features into web pages shall also be evaluated in light of the potential security risks. Features such as Active X controls and Java components have the capability of installing malicious programs on networks or on individual machines, if downloaded. The same danger exists when downloading any executable file, which is why many installations have a policy in place prohibiting downloads of such files. In general terms, it is recommended that existing local guidelines concerning the download/installation of executable files should apply to Active X controls, Java components, and any other software that installs programs on networks or individual machines.

4.10. Collection of Information. To better serve the public, in certain instances it is necessary and appropriate to collect information from visitors to web information services.

4.10.1. Forms/Information Collection.

4.10.1.1. In accordance with the Paperwork Reduction Act of 1995, (PRA), (reference (a)), collection of information from the public shall be approved by OMB under some circumstances.

4.10.1.2. Requests for identical information from ten or more members of the public must be approved by OMB, such as surveys using check box, radio button or text form fields.

4.10.1.3. The PRA applies to electronic forms/information collections on web information services that collect standardized information from the public. It does not apply to collection of information strictly from DoD employees or service members.

4.10.1.4. Forms for general solicitations of comments which do not seek responses to standard questions, such as the common opinion-based feedback forms and e-mail links, do not require OMB clearance.

4.10.1.5. Organizations are responsible for ensuring their publicly accessible web information services comply with this requirement and follow procedures in DoD 8910.1-M (reference (k)). For more information about the Paperwork Reduction Act of 1995, contact your local Information Management Control Office.

4.10.2. Usage Statistics. As a management function, evaluation of site usage data (log files) is a valuable way to evaluate the effectiveness of web information services. However, collection of data from public sites for undisclosed purposes is inappropriate. There are commercially available software packages that will summarize log file data into usable statistics for management purposes, such as the most/least requested documents, type of browser software used to access the web information service, etc. Use of this type of software is appropriate, as long as there is full disclosure as specified in the privacy and security notice, above. Organizations should establish a destruction disposition schedule for collected data.

4.10.3. User-identifying Collection Methods. In accordance with the privacy and security notice above, it is prohibited to use methods which collect user-identifying information such as extensive lists of previously visited sites, e-mail addresses, or other information to identify or build profiles on individual visitors. It is permissible to use "cookies" or other methods to collect or store non-user-identifying information to customize user sessions; however, users shall always be notified of what information is collected or stored, why it is being done and how it is used. Agencies subject to DoD Directive 5240.1 (reference (p)) must comply with its provisions.

4.11. DoD Webmaster Listserv. To share and coordinate information, an e-mail listserv has been established for all DoD "webmasters." All personnel responsible for developing and/or maintaining a web information service are encouraged to join this listserv. Although it is maintained by an Army unit, the list is open to members in all services. Instructions are located at <http://www.army.mil/weblist.htm>.

5. RESPONSIBILITIES

5.1. The Office of the Assistant Secretary of Defense for Public Affairs (OASD(PA)) shall:

5.1.1. Establish and maintain DefenseLINK as the official single point of access to all DoD information on the World Wide Web.

5.1.2. In coordination with the other OSD Principal Staff Assistants, provide oversight policy and guidance to ensure the absolute credibility of defense information released to the public through publicly accessible web information services.

5.1.3. Monitor compliance of this policy.

5.1.4. Ensure compliance with this policy for those activities in their purview.

5.2. The Assistant Secretary of Defense for Command, Control, Communications and Intelligence (ASD(C3I)) shall:

5.2.1. Maintain liaison with the Assistant Secretary of Defense for Public Affairs to provide policy oversight and guidance to ensure the effective dissemination of defense information via the Internet.

5.2.2. Provide technical support consistent with existing communication responsibilities.

5.2.3. Ensure compliance with this policy for those activities in their purview.

5.3. The other OSD Principal Staff Assistants shall:

5.3.1. Maintain liaison with the Assistant Secretary of Defense for Public Affairs to provide policy oversight and guidance to ensure the absolute credibility of defense information released to the public through publicly accessible web information services.

5.3.3. Ensure compliance with this policy for those activities in their purview.

5.4. The heads of the DoD Components shall ensure compliance with this policy for those activities in their purview.

6. EFFECTIVE DATE This policy is effective immediately.

APPENDIX N. CREATE DYNAMIC WEB PAGES WITH ACCESS97

Objective: To create a dynamic Web page utilizing FrontPage98 and Microsoft Access97 without utilizing scripting or altering underlying HTML code.

1. Create a folder to hold a database
 - (a) Open Windows Explorer
 - (b) Create a folder under the server default directory (i.e. "/inetpub") to hold all databases.
 - (c) Give the folder a useful name, such as "...WebDatabases" (ex: "SaintWebDatabases"). It should look something like this
"/inetpub/SaintWebDatabases" once it has been created. Note: Keep the database out of the web root (i.e. /inetpub/wwwroot), as it makes organizing and maintaining the Web site easier. Once the main database folder has been created, other subfolders can be added for specific individuals or departments. For example, to make a folder to store a database for the Operations Department, create a folder named "Operations" and place inside the "SaintWebDatabases" folder. It would look something similar to
"/inetpub/SaintWebDatabases/Operations/".
 - (d) Set sharing and security permissions on the folder as required through functions of Windows NT Server. For example, if you only want Administration personnel to have access to the database, set the permissions accordingly.
2. Create an Access database
 - (a) Open Access97
 - (b) Create a database with the desired tables, queries, forms and reports.
 - (c) Save it in a new database folder just made in the previous step. For example, if creating an Administration database, name the database "Admin.mdb" and save it in the "Administrations" folder.
3. Create a folder to hold Temporary HTML files that will be created
 - (a) Open Windows Explorer
 - (b) Create a folder under the server default directory (i.e. "/inetpub") to hold temporary HTML files that will be created from Access97 and then imported into Frontpage98 (further steps will explain that process). This step is required because files can't just be saved to a specific folder within the Web root, they have to be imported. Therefore, setting up a folder to hold the files in advance will make the import process flow smoothly.
 - (c) Give the folder a useful name, such as "...WebTempHTML"(ex: "SaintWebTempHTML") It should look something like this
"/inetpub/SaintWebTempHTML" once it has been created.
 - (d) Only one folder will be required to hold all temporary HTML files, so once it is created and named, it will not have to be created again. Note: Keep the folder out of the web root (i.e. /inetpub/wwwroot/) for similar reasons as the database.

- (e) There is no need to set security features for this folder as it is only a temporary holding spot for files which will eventually be deleted.
- 4. Create a folder within FrontPage to hold the files that will be created.
 - (a) Open FrontPage Explorer
 - (b) Create a "new folder" and place in desired subdirectory of the Web root "inetpub/wwwroot". For example, if the files to be created are for squadron recall information, then a folder named "Recall" would be created under the "Personnel" folder within the "Administration" subdirectory.
- 5. Set up an ODBC connection
 - (a) From the "Start" menu or "My computer" icon on the desktop, open up "Control Panel."
 - (b) Find the "ODBC" icon and open.
 - (c) Go to "System DSN" tab.
 - (d) Click on "Add"
 - (e) On "Create New Data Source", click on "MS database driver *mdb"
 - (f) On "ODBC Microsoft Access97 Setup", in the "Data source name" block type in the name of the database. For example, type in "Admin" for an MS Access97 database named 'Admin.mdb'.
 - (g) In the "Description" block, the naming convention is not important so choose whatever descriptive word or words desired.
 - (h) Under "Database", click on the "database" button. Browse through the server directory to find database. For example, the "Admin.mdb" would be found under a heading similar to
"d:/inetpub/SaintWebDatabases/Administration/Admin.mdb".
 - (i) Click on "OK", then again on next "OK", close out of Control Panel.
- 6. Save Access files as HTML
 - (a) Open the Access database previously created.
 - (b) From the drop down menu, select "File-Save as HTML"
 - (c) At this point the "Publish to the Web" wizard starts.
 - (d) Select which tables, queries, or forms to publish. For example, if a query named "Recall" was created, then place a check mark in that box. Note: Reports can only be saved as static HTML, but are save in the same manner as described in this section.
 - (e) Leave "what html document to use as default" blank or if you develop a template, then use that file as the default.
 - (f) Choose Dynamic HTX/IDC as format type. This will result in two files being produced, one as an IDC (.idc) and the other a HTX (.htx). Note: Choosing ASP is another option for creating dynamic pages, but the overhead and problems associated with implementing it is not worth the effort in this authors viewpoint. Note: Choosing Static HTML will produce only one file (.htm).
 - (g) In the Data Source Information block, under Data Source Name, type in the name of the Access database used in ODBC. For example, "Admin" would be the Data

Source Name for the personnel recall report. Unless, username and password are desired, leave those two input fields blank.

- (j) Under Microsoft Active Server Pages Output Options, leave blank unless using ASP. If using ASP, then type in the Server URL, for example "http://123.456.789.123.
 - (h) Use the Browse function to select "where to publish to" as the "...WebTempHTML" folder previously created.
 - (i) Do not check the block for "Yes, I want to create a homepage".
 - (j) Save information as a profile if desired, click on Finish.
7. Refresh data
- (a) Open Frontpage Explorer
 - (b) Use drop down menu to "View-Refresh".
 - (c) Then minimize the FrontPage Explorer window.
8. Import HTML files
- (a) Open Windows Explorer
 - (b) Find the newly created files (.htm, .idc, and .htx) that were saved in the "...WebTempHTML" folder.
 - (c) Minimize the Windows Explorer window and maneuver the window so that it is next to the minimized FrontPage Explorer window.
 - (d) Drag and drop the new files from the "...WebTempHTML" folder to the desired folder in the web root where the other files have been kept. For example, the "Recall" query saved as HTML would have two files named "Recall.htx" and "Recall.idc". These files would be "...WebTempHTML" folder in Windows Explorer to the "Personnel" folder in FrontPage Explorer. This process ensures that the files are imported properly. Note: Ensure that the folder containing the IDC and HTX files has the necessary sharing properties, including Execute for Microsoft Internet Information Server.
 - (e) Close the Windows Explorer window.
 - (f) Maximize the FrontPage Explorer window.
 - (g) From within the FrontPage Explorer window, use the drop down menu to "View-Refresh".
9. Connect new files to a current page
- (a) From FrontPage Explorer, go to "Navigation" view.
 - (b) Drag and drop the ".idc" file to desired location on the "tree". For example, drag and drop the "Recall.idc" file to join the tree underneath the Personnel Officer's Homepage (Personnel.htm). This will set up a link to the Recall table from the Personnel Officer's Homepage.
10. Test the result page.
- (a) From FrontPage Explorer, Open the desired ".htm" (i.e. "Personnel.htm").
 - (b) From FrontPage Editor, select "preview in browser" option from the drop down menu.
 - (c) Click on the "Recall" link and you should see the results of what you just submitted from the Access query.

11. Delete files in temporary HTML folder
 - (a) Open Windows Explorer and maximize window.
 - (b) If the form and results page checked out okay, then delete all the files (.htm, .idc, .htx) that are in the temporary HTM folder. This is done because they are no longer needed and to avoid confusion on future import cycles.

APPENDIX O. CREATE DYNAMIC WEB PAGES WITH FRONTPAGE FORMS

Objective: To create dynamic Web pages utilizing FrontPage98 and Microsoft Access97 without utilizing scripting or altering underlying HTML code.

1. Create a folder to hold a database
 - (a) Open Windows Explorer
 - (b) Create a folder under the server default directory (i.e. "/inetpub") to hold all databases.
 - (c) Give the folder a useful name, such as "...WebDatabases" (ex: "SaintWebDatabases"). It should look something like this
"/inetpub/SaintWebDatabases" once it has been created. Note: Keep the database out of the web root (i.e. /inetpub/wwwroot), as it makes organizing and maintaining the Web site easier. Once the main database folder has been created, other subfolders can be added for specific individuals or departments. For example, to make a folder to store a database for the Operations Department, create a folder named "Operations" and place inside the "SaintWebDatabases" folder. It would look something similar to
"/inetpub/SaintWebDatabases/Operations/".
 - (d) Set sharing and security permissions on the folder as required through functions of Windows NT Server. For example, if you only want Operations personnel to have access to the database, set the permissions accordingly.
2. Create an Access database
 - (a) Note: If a database has already been made, skip this part.
 - (b) Open Access97
 - (c) Create a blank database. Don't add any data, save it in a new database folder just made in the previous step. For example, if creating a pilot snivel log database, name the database "Snivel.mdb" and save it in the "Operations" folder.
3. Create a folder to hold Temporary HTML files that will be created
 - (a) Open Windows Explorer
 - (b) Create a folder under the server default directory (i.e. "/inetpub") to hold temporary HTML files that will be created from Access97 and then imported into Frontpage98 (further steps will explain that process). This step is required because files can't just be saved to a specific folder within the Web root, they have to be imported. Therefore, setting up a folder to hold the files in advance will make the import process flow smoothly.
 - (c) Give the folder a useful name, such as "...WebTempHTML"(ex: "SaintWebTempHTML") It should look something like this
"/inetpub/SaintWebTempHTML" once it has been created.
 - (d) Only one folder will be required to hold all temporary HTML files, so once it is created and named, it will not have to be created again. Note: Keep the folder out of the web root (i.e. /inetpub/wwwroot/) for similar reasons as the database.

- (e) There is no need to set security features for this folder as it is only a temporary holding spot for files which will eventually be deleted.
- 4. Create a folder within FrontPage to hold forms and other files.
 - (a) Open FrontPage Explorer
 - (b) Create a "new folder" and place in desired subdirectory of the Web root "inetpub/wwwroot". For example, if the form to be created is for pilots to snivel, then a folder named "Snivel" would be created under the "Schedules" folder.
- 5. Create a new home page
 - (a) From FrontPage Explorer, create a "new page" in the folder that was just created (i.e. "Snivel").
 - (b) Change the name of the new page from "default.htm" to something standard, such as "...Home.htm", that you'll use for all subsequent form homepages. For example, save the new page as "SnivelHome.htm".
 - (c) At this point, nothing else needs to be done to the new homepage.
- 6. Create a results page
 - (a) From FrontPage Explorer, create a "new page" in the folder that was just created (i.e. "Snivel").
 - (b) Change the name of the new page from "default.htm" to something standard, such as "...Results.htm", that you'll use for all subsequent form homepages. For example, save the new page as "SnivelResults.htm".
 - (c) At this point, nothing else needs to be done to the new result page.
- 7. Create a form page
 - (a) From FrontPage Explorer, create a "new page" in the same folder where you just placed the new homepage.
 - (b) Change the name of the new page from "default.htm" to something standard, such as "...Form.htm", that you'll use for all subsequent form pages. For example, save the new page as "SnivelForm.htm".
 - (c) At this point, nothing else needs to be done to the new homepage.
- 8. Create a data page
 - (a) From FrontPage Explorer, create a "new page" in the same folder where you just placed the new forms page.
 - (b) Change the name of the new page from "default.htm". In this case, you'll need to save the page as a text file. Therefore, change the name to something standard, such as "...Data.txt", that you'll use for all subsequent form pages. For example, save the new page as "SnivelData.txt". Note: This text file is where the information from the form will be placed when entered from the web browser. The Access97 database will retrieve its data from this file dynamically once it is set up properly.
 - (c) At this point, nothing else needs to be done to the new data page.
- 9. Set up Editor function
 - (a) Open Front Page Explorer
 - (b) On drop down menu, choose Tools-Options-Configure Editor.
 - (c) If not already assigned, add "txt" as a type and "notepad.exe" as the editor.

10. Create a confirmation page
 - (a) From FrontPage Explorer, create a "new page" in the same folder where you just placed the new data page.
 - (b) Change the name of the new page from "default.htm" to something standard, such as "...Confirm.htm", that you'll use for all subsequent form pages. For example, save the new page as "SnivelConfirm.htm".
 - (c) At this point, nothing else needs to be done to the new confirmation page.
11. Set up form page
 - (a) From FrontPage Explorer, open the file named "...Form.htm".
 - (b) Once the file has been opened, FrontPage Editor will be the new interface.
 - (c) Using the tools within FrontPage Editor, create desired form fields, such as drop down menus and text boxes.
12. Set up form field properties
 - (a) Place cursor inside each of the newly created form fields and right mouse click.
 - (b) Provide an accurate and short name to each field. Note: These field names will be the same names used in the Access Database.
13. Set up form validations
 - (a) Place cursor inside each of the newly created form fields and right mouse click.
 - (b) Assign desired validations. This is also where inputs are made for drop down menu selections.
14. Set up form properties
 - (a) Place the cursor inside of the newly created form and right mouse click.
 - (b) Go to "Form properties"
 - (c) Under "What to do with form results?", select send to and type in "...Data.txt" in the block. Note: Under other circumstances, you can select to either send the information to a specific email address, or to a Custom CGI or ASP script, Discussion Form Handler or Registration Form Handler.
 - (d) Click on the "Options" button.
 - (e) On the first tab "File Results", under file name type in "...Data.txt".
 - (f) Under file format, choose format as "text database delimiter with commas".
 - (g) Optional: you can select another file to send the data to at this point.
 - (h) On the second tab "Email results", select an email to receive results if desired.
 - (i) On the third tab, "Confirmation page", choose the "...Confirm.htm" file that was previously created.
 - (j) On the last tab "Saved fields", type in the form fields that you want to be coupled with the database.
 - (k) Save the form.
15. Set up confirmation page
 - (a) From FrontPage Explorer, open the file named "...Confirm.htm".
 - (b) Write something like "Confirmation message, your input form has been received". You can add FrontPage components such as "confirmation field" to make the confirmation message more personable, such as "Confirmation message, <Name> your input form has been received".

- (c) Create hyperlink back to the web site "homepage" or any other pages deemed appropriate. Otherwise user will have to use IE "back" function of browser.
- 16. Test form page
 - (a) Open "...Form.htm" in FrontPage Editor
 - (b) Select "Open in Browser" from drop down menu.
 - (c) Once opened in the web browser environment, input data to the form and submit.
- 17. Check data page
 - (a) Open "...Data.htm" in FrontPage Editor.
 - (b) Check to see that there is data separated by commas on this page. If so, close out of the page. If not, start troubleshooting.
- 18. Set up database file
 - (a) Open Access97
 - (b) Open the blank new database previously created.
 - (c) From the drop down menu, select "File-Get external data-link tables".
 - (d) Browse and choose the "...Data.txt" file made.
 - (e) Select "delimited".
 - (f) Select "commas".
 - (g) Fill in field name options. These will be the field names for the Access table and they should be similar to the form field names used when creating the FrontPage form.
 - (h) Name linked table with standard name, such as "...DataTable". For example, "SnivelDataTable" in the case of the snivel log.
- 19. Create a query (if query not desired, go to next step)
 - (a) From within the Access database, create "new" query. For example, if it were desired to separate snivels by month, there would have to be 12 queries created to correspond to each month.
 - (b) Select which table or query to use as input. In the snivel log example, the table selected would be "SnivelDataTable".
 - (c) Select desired fields for query.
 - (d) Open "design" view and make adjustments to query such as criteria and sort.
- 20. Set up an ODBC connection
 - (a) From the "Start" menu or "My computer" icon on the desktop, open up "Control Panel."
 - (b) Find the "ODBC" icon and open.
 - (c) Go to "System DSN" tab.
 - (d) Click on "Add"
 - (e) On "Create New Data Source", click on "MS database driver *mdb"
 - (f) On "ODBC Microsoft Access97 Setup", in the "Data source name" block type in the name of the database. For example, type in "Snivel" for an MS Access97 database named 'Snivel.mdb'.
 - (g) In the "Description" block, the naming convention is not important so choose whatever descriptive word or words desired.

- (h) Under "Database", click on the "database" button. Browse through the server directory to find database. For example, the "Snivel.mdb" would be found under a heading similar to "d:/inetpub/SaintWebDatabases/Operations/Snivel.mdb".
 - (i) Click on "OK", then again on next "OK", close out of Control Panel.
21. Save Access files as HTML
- (a) Open the Access database previously created.
 - (b) From the drop down menu, select "File-Save as HTML"
 - (c) At this point the "Publish to the Web" wizard starts.
 - (d) Select which tables, queries, or forms to publish. Note: Reports can only be saved as static HTML and are addressed in a different appendix so named.
 - (e) Leave "what html document to use as default" blank. If you develop a template, then use that as the default.
 - (f) Choose Dynamic HTX/IDC as format type. This will result in two files being produced, one as an IDC (.idc) and the other a HTX (.htx). Note: Choosing ASP is another option for creating dynamic pages, but the overhead and problems associated with implementing it is not worth the effort in this authors viewpoint.
 - (g) In the Data Source Information block, under Data Source Name, type in name of Access Database used in ODBC. For example, "Snivel" would be the Data Source Name for the pilot snivel log. Unless, username and password are desired, leave those two input fields blank.
 - (h) Under Microsoft Active Server Pages Output Options, type in the Server URL For example "http://123.456.789.123.
 - (i) Use the Browse function to select "where to publish to" as the "...WebTempHTML" folder previously created.
 - (j) Do not check the block for "Yes, I want to create a homepage".
 - (k) Save information as a profile if desired, click on Finish.
22. Refresh data
- (a) Open Frontpage Explorer
 - (b) Use drop down menu to "View-Refresh".
 - (c) Then minimize the FrontPage Explorer window.
23. Import HTML files
- (a) Open Windows Explorer
 - (b) Find the newly created files (.htm, .idc, and .htx) that were saved in the "...WebTempHTML" folder.
 - (c) Minimize the Windows Explorer window and maneuver the window so that it is next to the minimized FrontPage Explorer window.
 - (d) Drag and drop the new files from the "...WebTempHTML" folder to the desired folder in the web root where the other files have been kept. For example, the "Snivel" query saved as HTML would have two files named "Snivel.htx" and "Snivel.idc". These files would be dragged and dropped from the "...WebTempHTML" folder in Windows Explorer to the "Schedules" folder in FrontPage Explorer. This process ensures that the files are imported properly.

Note: Ensure that the folder containing the IDC and HTX files has the necessary sharing properties, including Execute for Microsoft Internet Information Server.

- (e) Close the Windows Explorer window.
- (f) Maximize the FrontPage Explorer window.
- (g) From within the FrontPage Explorer window, use the drop down menu to "View-Refresh".

24. Set up homepage

- (a) Open the "...Home.htm" file in the appropriate folder in FrontPage Explorer.
- (b) Make any changes to shared borders, background, hyperlinks, colors, etc. to achieve desired results.
- (c) Insert text on the page to identify it. For example, "Snivels Homepage" in big letters will let users know what the page is about.
- (d) From FrontPage Explorer, go to "Navigation" view.
- (e) Drag and drop the "...Home.htm" file to desired location on the "tree". For example, drag and drop the "SnivelHome.htm" to join the tree underneath the Schedules Officer Homepage (Schedules.htm file). This will set up a link to the Snivels Homepage from the Schedules Officer Homepage.
- (f) While in "Navigation" view, drag and drop the "...Form.htm" and "...Results.htm" files to join the tree underneath the "...Home.htm" file that was joined to the tree in the previous step. Rename the files if desired, such as "Submission form" and "Results".

25. Set up form page

- (a) From FrontPage Explorer, go to "Folders" view.
- (b) Open the "...Form.htm" file and make any changes, such as shared borders, background, hyperlink colors, etc.

26. Set up results page

- (a) Open the "...Results.htm" file and make any changes, such as shared borders, background, hyperlink colors, etc.
- (b) Insert a table if more than one hyperlink is desired.

27. Test links

- (a) From FrontPage Explorer, Open "...Home.htm" .
- (b) From FrontPage Editor, select "preview in browser" option from the drop down menu.
- (c) Click on the "Submission Form" link and check to ensure that the form page pops up on screen, then click on "up" to return to the "Homepage".
- (d) Click on the "Results" link and ensure that the results form page pops up on screen, then click on "up". Ensure that these links are working properly. If they aren't, start troubleshooting.

28. Test form page

- (a) Click on the "Submission Form" link.
- (b) Fill in the form. Test any validation properties that were set, test the reset button, and then test the submit button.

- (c) After clicking on the submit button, you should receive a confirmation message from the confirmation page.
- 29. Test the result page.
 - (a) From FrontPage Explorer, Open "...Home.htm".
 - (b) From FrontPage Editor, select "preview in browser" option from the drop down menu.
 - (c) Click on the "Results" link and you should see the results of what you just submitted through the form.
- 30. Delete files in temporary HTML folder
 - (a) Open Windows Explorer and maximize window.
 - (b) If the form and results page checked out okay, then delete all the files (.htm, .idc, .htx) that are in the temporary HTML folder. This is done because they are no longer needed and to avoid confusion on future import cycles.
- 31. Managing outdated information.
 - (a) As information becomes outdated, the webmaster will have to delete certain information in order to keep data current. This function will be managed from within Frontpage.
 - (b) Open FrontPage Explorer, Open "...Data.txt".
 - (c) Delete data that is outdated. Note: Be careful to keep desired data intact as any deviations to the data content will impact its link to the database.
 - (d) Close out of "...Data.txt" file and save.

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APPENDIX P. DISA ANTI-VIRUS LICENSE AGREEMENTS

"ARLINGTON, Va.--On 04 September 1998 the Defense Information Systems Agency (DISA) awarded two GSA Schedule orders exercising the first option renewing the October 1997 Department of Defense (DOD) anti-virus software enterprise licenses. Awards went to Network Associates Inc., (formerly McAfee Software Associates), of Santa Clara, CA, and to Corporate Software and Technology, formerly Stream International, Inc., a GSA Schedule reseller for Symantec Corporation, of Cupertino, CA. The Network Associates license is for their full line of "McAfee - Total Virus Defense" anti-virus security products and the Symantec license provides their entire line of "Norton Anti-Virus Solution" products. These awards mark the second of five landmark GSA Schedule annual buys protecting DOD's approximately 1.5 to 2 million users and PC's globally, with desktop and network anti-virus software both at work and at home. (PDF versions of this year's signed license agreements for Network Associates/McAfee and Symantec/Norton are available. To read PDF documents download/install Adobe Acrobat Reader.)

These performance-based licenses are flexibly structured to provide long-term reliability, protection, portability, scalability, and stability to DOD as information technology evolves. As such, several highlights and product enhancements have automatically become covered by DOD's licenses since the time of last year's initial award. Network Associates' Total Virus Defense has improved protection with new versions of products for Windows 98, Microsoft Exchange, Lotus Notes, Internet Gateways, protection from both hostile ActiveX and Java, and they have recently added Dr. Solomon's anti-virus to their product line. Symantec has added to their Norton Anti-Virus product line Window 98, Lotus Notes, Microsoft Exchange, detection of Java viruses, and has absorbed, through a strategic alliance, IBM's immune system anti-virus technology.

DOD users and network administrators (with ".mil" IP addresses) can get more information and software downloads from DISA's Automated System Security Incident Support Team (ASSIST) website:
<http://199.211.123.12/virus/avirous.htm>."

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